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A taxonomic revision of the family Oncopodidae IV. The genus *Oncopus* Thorell (Opiliones, Laniatores)

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A taxonomic revision of the family Oncopodidae IV. The genus *Oncopus* Thorell (Opiliones, Laniatores). - The known *Oncopus* species are revised and their penis morphology is illustrated. Distinct sexual dimorphism in external characters of some species is pointed out. *Oncopus alticeps* Pocock is placed in the synonymy of *O. feae* Thorell and *O. acanthochelis* Roewer in the synonymy of *O. truncatus* Thorell. Four new species are described: *O. malayanus* sp. n. from Peninsular Malaysia, *O. tiomanensis* sp. n. from Tioman Island (Malaysia), *O. lingga* from two Indonesian islands in the Lingga Archipelago and *O. expatriatus* sp. n. seemingly from Thailand (dubious record; more likely occurring on Borneo). Nine valid species are recognized and placed in four species groups; relationships and zoogeography are discussed.

Key-words: Opiliones - Oncopodidae - *Oncopus* - new species - taxonomy - zoogeography - Southeast Asia.

INTRODUCTION

This is our fourth contribution in the course of a revision of the family Oncopodidae, completing the treatment of known species (see Martens & Schwendinger, 1998; Schwendinger & Martens, 1999, 2002). The present paper deals with the genus *Oncopus*, in which seven species were hitherto known [not including *O. cuspidatus* Schwendinger, which was only provisionally described in this genus (see Schwendinger, 1992: 197) and later transferred to *Caenoncopus* (see Martens & Schwendinger, 1998: 507)] and the taxonomy of which is in considerable confusion. As most previous authors were seemingly unaware of external sexual dimorphism in this genus (present also in some species of *Gnomulus*), did not take into consideration genital characters and described most species from single specimens (several of them ♀♀, one even a juvenile), species distinctions were by no means clear. No *Oncopus* species was hitherto known from both sexes, and only in *O. megachelis* was penis morphology described [the illustration of an *Oncopus* penis by Martens (1986: fig. 7) was not assigned to any species; it refers to *O. truncatus*]. Two species were described

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and named twice: *O. feae* Thorell (from Penang Island) originally from a ♀ and later again from a ♂ (described as *O. alticeps*) by Pocock; *O. truncatus* Thorell (from Singapore Island) originally from a juvenile and subsequently again from a ♀ (described as *O. acanthochelis*) by Roewer. The latter author caused further confusion by identifying a ♂, which clearly belongs to *O. doriae* (occurring in Sarawak, Borneo), as "*O. alticeps*" and giving Thailand as its country of origin (see Roewer, 1923: 60). Another ♂ in his collection (unpublished record; here described as *O. expatriatus* sp. n.) was identified as "*Pelitnus alticeps*", a species that was never formally described (probably a misunderstanding for *Oncopus alticeps*) and also referred to as originating from Thailand, but penis morphology suggests that this species probably occurs on Borneo as well.

MATERIAL AND METHODS

External structures were studied and drawn with a ZEISS SV11 stereomicroscope, the penes with a NIKON Optiphot compound microscope (each with a drawing tube). In contrast to other genera, the penes of *Oncopus* ♂♂ examined were often partly expanded, i.e. the glans raised from the proximad-directed resting position by about 30°. Drawings were made with the glans pressed back into its resting position by squeezing the apex of the penis between a microscopic slide with a well (filled with diluted glycerine) and a cover slide.

Body measurements refer to the dorsal scutum. Leg articles were measured on their dorsal side, from midpoint of anterior margin to midpoint of posterior margin. All measurements are given in mm. Terminology of penis morphology follows that of Martens & Schwendinger (1998: fig. 1).

Abbreviations used in the text. Fe - femur, Mt - metatarsus, Pa - patella, Ta - tarsus, Ti - tibia, Tr - trochanter.

CCD - collection of Christa Deeleman-Reinhold, Ossendrecht; MAR - collection of J. Martens, Mainz; MCZ - Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; MHNG - Muséum d'histoire naturelle, Genève; MSNG - Museo Civico di Storia Naturale, Genova; NHML - Natural History Museum, London [formerly British Museum (Natural History)]; SMF - Naturmuseum und Forschungsinstitut Senckenberg, Frankfurt; ZMT - Zoological Museum, University of Turku; ZRC - Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore.

TAXONOMY

Oncopus Thorell, 1876

Oncopus Thorell (1876: 134-135). - Thorell (1891: 99-100). - Loman (1902: 182). - Roewer (1923: 57). - Sørensen (1932: 210-211). - Martens & Schwendinger (1998: 552). - Schwendinger & Martens (2002b: 425-426).

Type species. Oncopus doriae Thorell, 1876 by original designation and by monotypy.

Diagnosis. Large to very large oncopodids (5.9-10.8 mm), characterized by only one tarsal article on all legs. Interocular area a low, forward-directed tubercle, a low rounded hump or not elevated; carapace region larger and more or less distinctly elevated in ♂♂; carapace-abdomen bridge indistinct, wide, undivided, never in the shape of two opposing teeth (as in *Gnomulus* and *Biantoncopus*); ventral scutal elevations of ♂♂ keeled, with transversal bands of white enclosures embedded in the cuticle; ventral side of leg coxa II usually with scale- or knob-shaped apophysis at its anteroproximal corner [indistinctly developed (as in *Gnomulus* spp.) only in *O. hosei* and *O. megachelis*]; stigmatic pit narrow, its posterior margin without tubercle; chelicerae robust (stronger in ♂♂ than in ♀♀), with anteriad-inclined prodorsal boss extending into more or less strongly developed dorsomedian boss on proximal article and with ventral process on proximal, median and often also on distal article (= mobile finger); palps with more or less pronounced ventral tubercles on coxa, trochanter, proximal and subdistal part of femur, proximal and distal part of tibia; some species also with wide proventral process on patella. Penis with one or several pairs of terminal setae on distal margin of truncus; glans proximad-directed, more or less distinctly narrower than truncus at that point, with U-, V- or W-shaped median plate, outwards-bent lateral sclerites, long membranous tubes and slender, tubular stylus with moderately bulbous base and with pair of subterminal teeth.

Remarks. Possible synapomorphies for the genus *Oncopus* are: 1) tarsalia reduced to a single article on all legs; 2) ventral process present on 3rd cheliceral article (mobile finger; Figs 77-85); 3) anteroproximal apophysis on ventral side of leg coxa II more strongly developed than in other genera, scale-like (Fig. 71) or (rarely) knob-like (Figs 24-26); 4) ventral scutal elevations in ♂♂ keeled, containing white enclosures (Fig. 27b); 5) distal margin of truncus penis carrying terminal setae (Figs 4-7); 6) sexual dimorphism in shape and size of carapace region and of chelicerae (see Figs 11, 12 and Figs 13, 14). The latter is also present in some *Gnomulus* species (e.g., *G. sumatranus* Thorell) and indicates (together with its proximad-directed, symmetrical glans penis) a close relationship between *Oncopus* and *Gnomulus* (see Schwendinger & Martens, 2002b).

Species account and distribution. Nine valid species are here recognized: *O. expatriatus* sp. n. allegedly from Thailand (dubious record; more likely occurring on Borneo); *O. feae* Thorell from Penang Island (W-Malaysia); *O. malayanus* sp. n. from central Peninsular Malaysia and from Pangkor Island off the west coast of the peninsula; *O. tiomanensis* sp. n. from Tioman Island off the east coast of Peninsular Malaysia; O. *truncatus* Thorell from Singapore Island and from the southernmost part of Peninsular Malaysia; *Oncopus lingga* sp. n. from two islands in the Lingga Archipelago (Indonesia); *Oncopus doriae* Thorell from western Sarawak; *Oncopus hosei* Pocock from eastern Sarawak; *Oncopus megachelis* Schwendinger from Sabah. Two presumably undescribed species occur in northern Sumatra and in southeastern Kalimantan, respectively (see "Unidentified material") (Fig. 1).

THE *FEAE*-GROUP

Diagnosis. Large species (5.9-9.7 mm body length) with more or less distinctly forward-inclined interocular area; paramedian processes on opisthosomal area VIII

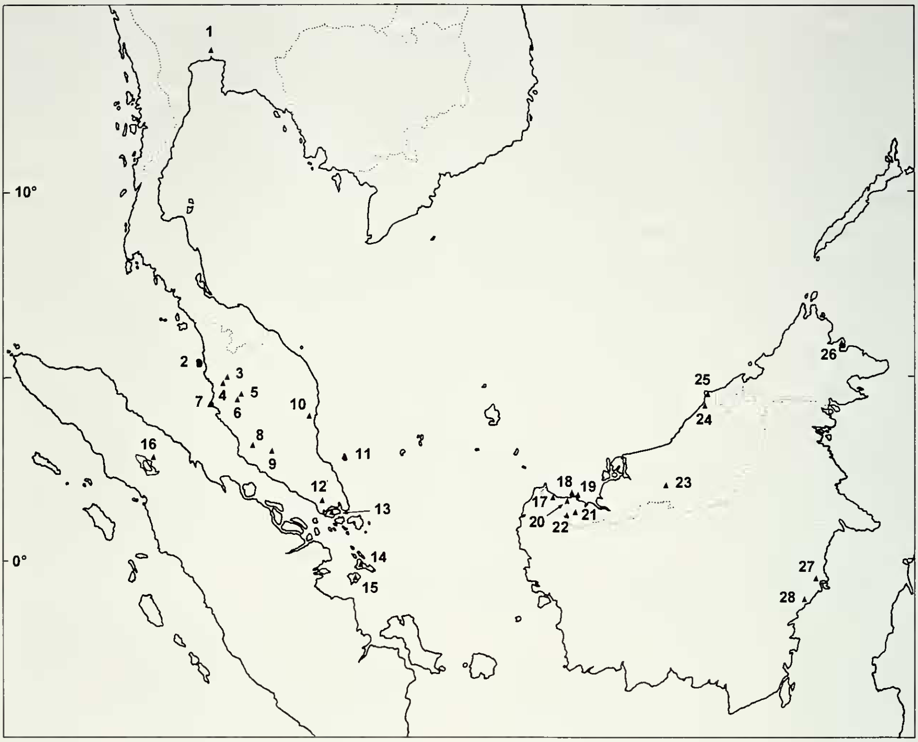


FIG. 1

Known records of *Oncopus* species. - 1 Bangkok (*O. expatriatus* sp. n.; dubious record), 2 Penang Island (*O. feae*), 3 Padang Gerus (*O. malayanus* sp. n.), 4 Maxwell Hill (*O. malayanus* sp. n.), 5 Cameron Highlands (*O. malayanus* sp. n.), 6 Chenderiang (*O. malayanus* sp. n.), 7 Pangkor Island (*O. malayanus* sp. n.), 8 Templer Park, Ulu Gombak, Kuala Lumpur (*O. malayanus* sp. n.), 9 Pasoh Forest (*O. malayanus* sp. n.?), 10 Bukit Charas (*Oncopus* sp.), 11 Tioman Island (*O. tiomanensis* sp. n.), 12 Gunung Pulai (*O. truncatus*), 13 Singapore Island (*O. truncatus*), 14 Lingga Island (*O. lingga* sp. n.), 15 Singkep Island (*O. lingga* sp. n.), 16 forest near Prapat (*Oncopus* sp.), 17 Batu Lundu, Gunung Gading (*O. doriae*), 18 Gunung Santubong (*O. doriae*), 19 Bako National Park (*O. doriae*), 20 Gunung Serapi (*O. doriae*), 21 Balai Ringin (*O. doriae*), 22 Gunung Penrissen (*O. doriae*), 23 Kapit (*Oncopus* sp.), 24 Lambir Hills National Park (*O. hosei*), 25 Kuala Baram (*O. hosei*), 26 Kabili-Sepilok Forest Reserve (*O. megachelis*), 27 Sangasanga Muara (*Oncopus* sp.), 28 Sepaku (*Oncopus* sp.).

projecting beyond posterior margin of dorsal scuta; penes slender, more or less gradually widening towards apex with almost straight distal margins carrying three to five terminal setae on each side.

This species group is close to the *truncatus*-group and contains two species (*O. feae* and *O. malayanus* sp. n.) from the northern and central parts of Peninsular Malaysia.

Oncopus feae Thorell, 1890 Figs 2-26

Oncopus feae Thorell (1890: 375-377); description of ♀. - Roewer (1923: 58). - Sørensen (1932: 211-213, figs 1-2). - Bristowe (1976: 7-11, figs 1-6, pl. 1-2). - Moritz (1993: fig. 299A); drawing. - Murphy & Murphy (2000: pl. 2.1); photo.

Oncopus alticeps Pocock (1897: 287, fig. 2), **syn. n.**; description of ♂. - Roewer (1923: 59-60, fig. 62); see also treatment of *O. doriae* in present paper.

Types. MALAYSIA (peninsula), Pulo Pinang (= Pulau Penang = Penang Island), 1 ♀, 4 juvenile syntypes (MSNG, examined), leg. L. Loria and L. Fea, 1889; ♀ here designated lectotype in order to preserve stability of nomenclature.

Other material. From Penang Island: 1 ♂ (holotype of *O. alticeps*), 1897.1.25.1 (NHML); Batu Feringgi, 20 m, 2 juveniles, leg. G. Cuccodoro & I. Löbl, 10.XI.1999; Batu Feringgi, 100 m, 1 ♂, 1 ♀, leg. G. Cuccodoro & I. Löbl, 13.XI.1999; forest above Botanical Garden, 250 m, 3 ♀, leg. G. Cuccodoro & I. Löbl, 12.XI.1999; Penang Hill (= Bukit Bendera), 650 m, 1 ♂, 5 ♀, 2 juveniles, leg. G. Cuccodoro & I. Löbl, 19.XI.1999; Penang Hill, 650-760 m, 1 ♂, leg. P.J. Schwendinger, 19.I.1995; Penang Hill, 710 m, 1 ♂, leg. P.J. Schwendinger, 8./9.XII.1997; all latter specimens deposited in MHNG.

Diagnosis. Distinguished by: interocular area more or less distinctly forward-inclined; pair of paramedian tubercles distinctly projecting beyond posterior margin of dorsal scutum; anteroproximal process on ventral side of coxa II developed as longitudinal bulge; second cheliceral article with ventroproximal hump; mobile cheliceral finger with ventroproximal boss; ventroproximal process on palpal tibia distinct; penis with three to five terminal setae on each side, lateral sclerites of glans distally wide, truncate.

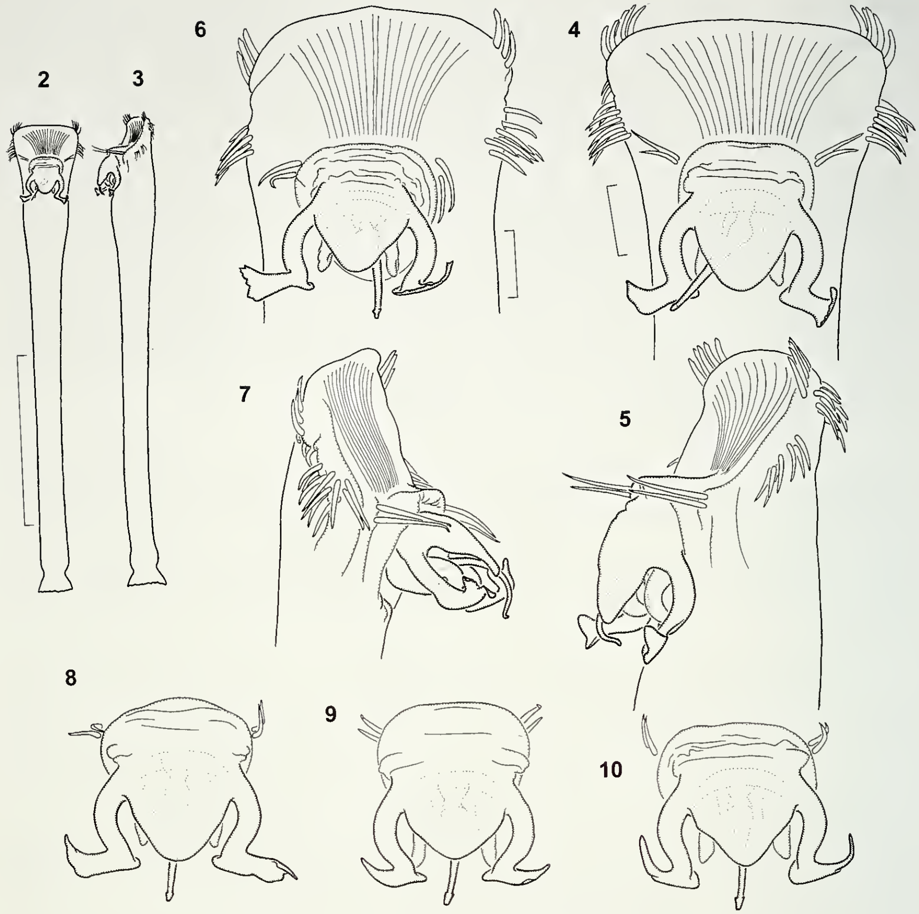
Redescription. Large species (8.7-9.7 mm long). Carapace region of dorsal scutum with more or less distinctly forward-inclined interocular area, low in ♀♀ (Figs 11, 18), arched and distinctly elevated above opisthosomal region in ♂♂ (Figs 13, 15-17); paramedian pairs of tubercles present on opisthosomal areas VI-VIII, the last one distinctly protruding beyond posterior margin of dorsal scutum (Figs 12, 14). Anteroproximal apophysis of coxa II knob-shaped in ♂♂ (Figs 24-26), scale-like in ♀♀ (Fig. 23); process posterior to apophysis of coxa II developed as longitudinal bulge, anteroproximal process on coxa III small (Figs 23-26).

Chelicerae robust, stronger in ♂♂ (Figs 14, 20) than in ♀♀ (Figs 12, 19), with pronounced ventral tubercle on first article; ventral side of second cheliceral article with distal process and proximal hump (indicated by arrow in Figs 19, 20); mobile finger of chelicera with distinct ventroproximal boss.

Pedipalps (Figs 21, 22) with distinct ventral process on trochanter, small ventroproximal process on femur and distinct ventroproximal process on tibia; no proventral process on palpal patella.

Legs: femur of leg II with small dorsoproximal tubercle, femur IV with indistinct ventroproximal tubercle.

Penis (Figs 2-10) fairly slender, with slightly rounded distal margin carrying three to five terminal setae on each side; glans about as wide as truncus at that point (wider when lateral sclerites are pressed sideward during examination on a temporary slide), flanked by two setae on each side; lateral sclerites slender at base, distally widening to truncate tips with more or less distinctly serrate terminal edge, bent outwards and away from truncus; median plate broadly V-shaped, distally rounded; membranous tubes long, protruding far beyond median plate.

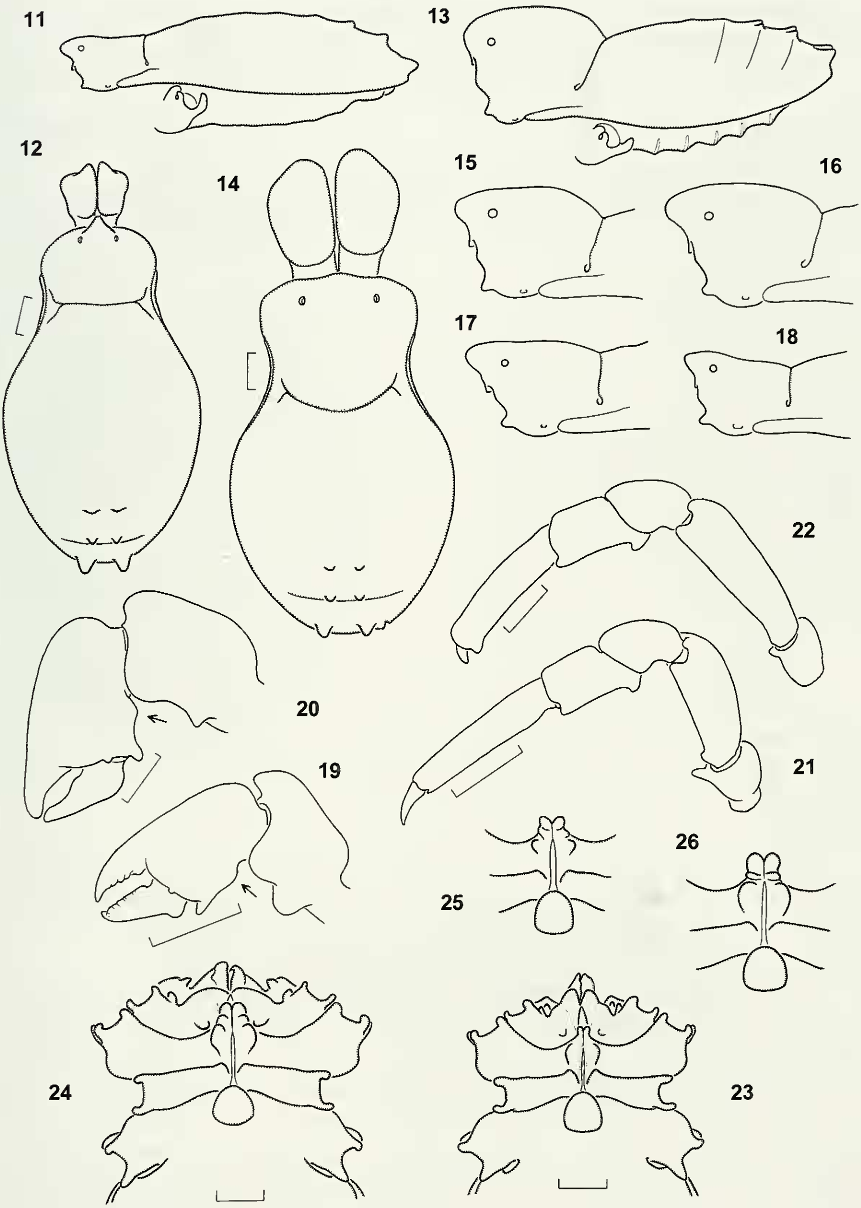


Figs 2-10

Oncopus feae Thorell: ♂ holotype of *O. alticeps* (here placed in the synonymy of *O. feae*) (6, 7); 3 ♂ from Penang Hill (2-5, 8, 9); ♂ from Batu Feringgi, Penang (10). - Penis, dorsal (2) and lateral view (3); apex of penis, dorsal (6, 4) and lateral view (5, 7); glans penis, dorsal view (8-10). - Scale lines 1.0 mm (2, 3), 0.1 mm (4-10).

Variation. Measurements (♂, in parentheses ♀): body 8.67-9.67 (8.77-9.45) long, 4.80-5.98 (4.96-5.39) wide; carapace region 2.48-3.74 (2.08-2.39) long, 3.22-4.11 (2.91-3.16) wide; ♂ (n = 5), ♀ (n = 10). Variation in the shape of the interocular areas see Figs 11, 13, 15-18, of glans penis see Figs 4, 6, 8-10. In some ♂♂ the knob-shaped anteroproximal apophysis on coxa II is divided into two parts (Figs 24-26).

Remark. In 2 ♂ the penis is subdistally collapsed and its distal margin therefore looks more strongly rounded [Fig. 6 (holotype of *O. alticeps*, here placed in the synonymy of *O. feae*)] than in the other ♂♂ examined (Fig. 4).



FIGS 11-26

Oncopus feae Thorell: ♀ lectotype (11, 12, 19, 21, 23); ♂ holotype of *O. alticeps* (here placed in the synonymy of *O. feae*) (13, 14, 20, 22, 24); 3 other ♂♂ (15-17, 25, 26); other ♀ (18). - Body, lateral (11, 13) and dorsal view (12, 14); anterior part of body, lateral (15-18) and ventral view (23-26; 25, 26 showing only central portion); left chelicera (19, 20; arrows pointing to ventroproximal hump of second article) and left palp (21, 22), retrolateral view. - All scale lines 1.0 mm.

Relationships. Oncopus feae is externally similar to *O. doriae*, but genital morphology shows that the former is most closely related to *O. malayanus* sp. n.

Distribution. This species is known only from Penang Island [Fig. 1 (2)].

Oncopus malayanus sp. n. Figs 27-54

Oncopus alticeps Pocock. - Šilhavý (1974: 25); misidentification.
Oncopus cfr. *alticeps* Pocock. - Giribet *et al.* (2002); molecular study.
Oncopus feae Thorell. - Šilhavý (1974: 25; sub *O. feai*, incorrect subsequent spelling); misidentification.

Material. MALAYSIA (peninsula), Perak, Pangkor Island, forest near Kampung Sungai Cempedak, 30 m, ♂ holotype, 1 ♂, 7 ♀ paratypes (MHNG), leg. P.J. Schwendinger, 15./16.XII.1997; Padang Gerus, 200 m, 1 ♀ paratype (MHNG), leg. P.J. Schwendinger, 15.I.1995; Maxwell Hill (= Bukit Larut), 1100 m, 1 juvenile (MHNG), leg. G. Cuccodoro & I. Löbl, 21.XI.1999; Maxwell Hill, 1500 m, 1 ♀ paratype, 1 penis (MHNG; with label "*Oncopus alticeps*, det. Šilhavý, 1972"), leg. T. Jaccoud, 6.VIII.1969; Chenderiang, 290-330 m, 1 ♀ paratype (HMNG), leg. P.J. Schwendinger, 22.-31.I.1994; Perak, without exact locality and data, 1 ♂ paratype (SMF 299/2) with label "*Oncopus alticeps* Poc., 1 ♂, Roewer det. 1925", no name of collector, no date; Pahang, Cameron Highlands, Tanah Rata, Trail No. 9, 1400 m, 2 ♀ paratypes (MHNG), leg. Löbl & Calame , 27.III.1993; Templer Park (NW of Kuala Lumpur), 370 m, 1 juvenile (MHNG), leg. P.J. Schwendinger, 13.VII.2001; Selangor, Ulu Gombak, 200 m, 1 ♀ paratype, 1 juvenile (MHNG), leg. Agosti, 26.IX.1991; Ulu Gombak, 1 ♂ paratype (penis missing) (MAR), leg. Rohe & Maschwitz, XII.1988; 30 km N of Kuala Lumpur, 1 ♂ paratype (MAR), leg. A. Dorow, II.1986; Penchala, Kuala Lumpur, 2 ♀ paratypes (MHNG; with label "*O. feai*, det. Šilhavý, 1971"), leg. T. Jaccoud, 8.IX.1969.

Diagnosis. Similar to *O. feae*, distinguished by: paired paramedian tubercles on dorsal scutal area VIII smaller, only little protruding beyond scutal margin; ventral side of coxa II with scale-like anteroproximal apophysis in ♂♂, process posterior to it low, widely rounded, posteroproximal process present; chelicerae without subbasal ventral hump on second article and without subbasal boss on mobile finger; penis with narrower glans carrying distally pointed lateral sclerites.

Description. ♂ (holotype). Coloration: body amber, with dark reticulation on carapace, chelicerae and palps; dark margin on dorsal scutum and dark pattern on its opisthosomal part (Fig. 27a, c); legs dark, except for lighter distal portion of metatarsi, lighter tarsi III and IV, and cream tarsi I and II.

Carapace region of dorsal scutum large and moderately elevated, interocular area low, rounded, only slightly projecting beyond carapace front margin (Fig. 27c). Opisthosomal areas of dorsal scutum indistinctly elevated in posterior part, with pairs of small paramedian tubercles on areas VI-VIII, the last pair slightly protruding beyond posterior margin (Fig. 27a, c); ventral scutal areas keeled, with transversal bands of white enclosures (Fig. 27b, c). Palpal coxa with long, digitiform ventral process; ventral side of leg coxa I with conical anterolateral and knob-shaped central processes; coxa II with broad scale-like anteroproximal apophysis, with low, rounded process posterior to it, and with more pronounced, rounded posteroproximal process overlapping short anteroproximal process on coxa III. Genital operculum rounded, slightly longer than wide (Fig. 27b).

Chelicerae (Fig. 45) strong; proximal article with strong, rounded retroventral tubercle; second article with small ventrodistal process and with characteristic prodorsal subproximal hump (Fig. 45; see arrow); mobile finger without ventral process,

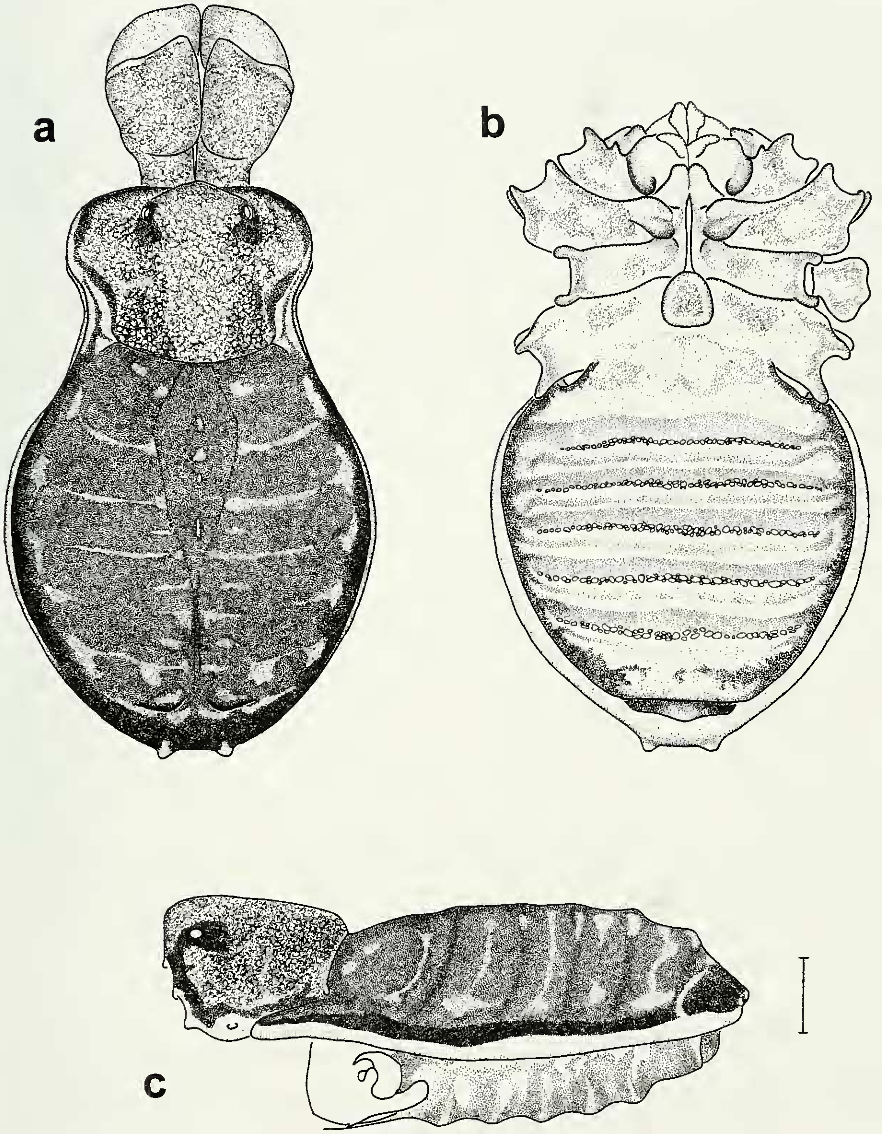


FIG. 27
Oncopus malayanus sp. n.: ♂ holotype. - Body, dorsal (a), ventral (b) and lateral view (c). - Scale line 1.0 mm.

its inner side with sharp, keel-shaped cutting edge only in distal half (worn in proximal half?).

Palps (Fig. 48): trochanter with small, slightly distad-inclined ventral process; femur unarmed; patella without proventral process; tibia with distinct retroventral proximal hump.

Legs 3124; femur II without dorsoproximal tubercle; only low rounded hump ventroproximally on femur IV.

Penis (Figs 28-31): truncus relatively slender, more or less continually widening from base to apex, slightly constricted at height of glans; distal margin slightly arched, with three and four lateral setae on each side. Glans penis much narrower than truncus at that point, flanked by two setae on each side; lateral sclerites slender, with pointed tips bent outwards and away from the truncus; median plate broadly rounded, almost semicircular; membranous tubes long, protruding far beyond median plate.

♀ (from the type locality). As the ♂ but carapace region of dorsal scutum less elevated in posterior part (Fig. 43); ventral scutal areas only slightly elevated, rounded; chelicerae much weaker but with more distinct dorsal hump on second article (Fig. 46); palps weaker, with small ventroproximal tubercle on femur (Fig. 53); coxa II with smaller anteroproximal apophysis, with conical process posterior to it, and with less pronounced posteroproximal process.

Measurements. ♂ holotype (♀ from the type locality in parentheses): body 7.50 (6.79) long, 4.81 (4.26) wide; carapace region 2.41 (1.67) long, 3.21 (2.53) wide. - Palp and legs:

	Tr	Fe	Pa	Ti	Mt	Ta	Total
Palp	1.11 (0.80)	1.94 (1.27)	1.11 (0.86)	0.86 (0.65)	- -	1.91 (1.54)	6.93 (5.12)
Leg I	0.86 (0.74)	2.65 (2.28)	1.14 (1.05)	1.14 (1.02)	2.28 (2.04)	0.43 (0.43)	8.50 (7.56)
Leg II	1.05 (0.86)	3.46 (2.96)	1.45 (1.33)	2.04 (1.70)	3.36 (2.90)	0.43 (0.43)	11.79 (10.18)
Leg III	0.86 (0.74)	2.25 (1.98)	1.17 (1.05)	1.11 (0.99)	2.47 (2.16)	0.43 (0.43)	8.29 (7.35)
Leg IV	1.11 (1.05)	2.90 (2.78)	1.60 (1.42)	1.98 (1.79)	3.95 (3.58)	0.46 (0.43)	12.00 (11.05)

Variation. Measurements (♂, in parentheses ♀): body 6.88-8.55 (5.90-9.10) long, 4.26-5.52 (3.46-6.08) wide; carapace region 1.76-2.93 (1.56-2.35) long, 2.59-3.61 (2.16-3.46) wide; ♂ (n = 5), ♀ (n = 15). Three to five terminal setae present on each side of distal penis margin. Variation in external morphological characters between and within different populations of *O. malayanus* sp. n. is more pronounced than in other species:

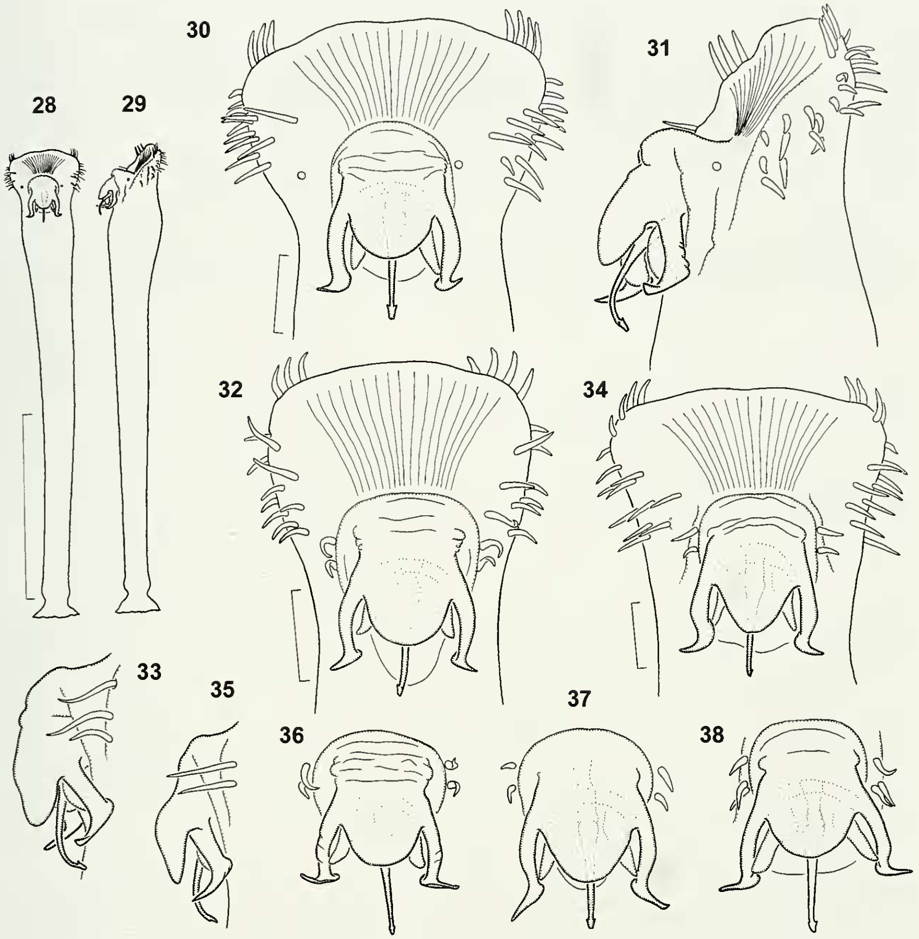
1 ♂ from the type locality has a low carapace region (Fig. 42), as otherwise only seen in ♀♀ (see Figs 43, 44).

The interocular area is moderately pointed and bent forward in the ♂ from Ulu Gombak (Fig. 40) and in the ♂ (Fig. 41) and ♀ from Kuala Lumpur, whereas it is rounded and not inclined in the other specimens examined (see Figs 27c, 39, 42-44).

The specimens from Pangkor Island possess a very strong and prominent retroventral process on the first cheliceral article (Figs 45, 46), in others this process is distinctly smaller (Fig. 47).

The characteristic dorsal hump on the second cheliceral article is distinct in specimens from the northern populations (including Pangkor Island; Figs 45, 46, see arrows), less pronounced in the ♀♀ from the Cameron Highlands and Ulu Gombak and in the ♂ from "Perak", and absent in specimens from near Kuala Lumpur (Fig. 47).

Some specimens possess a small ventroproximal process on palpal femur (Figs 49, 50, 53), others, even within the same population, lack it (Fig. 48).

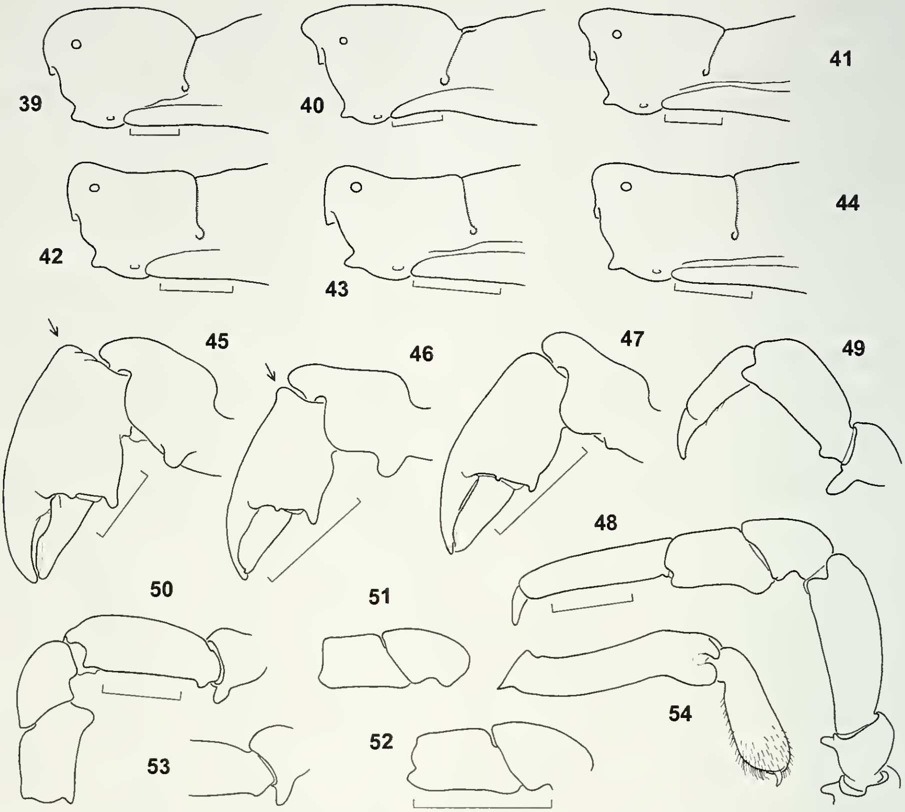


FIGS 28-38

Oncopus malayanus sp. n.: ♂ holotype from Pangkor Island (28-31); ♂ paratypes from Ulu Gombak (32, 33), Maxwell Hill (34, 35), Kuala Lumpur (36), Pangkor Island (37) and Perak (38). - Penis, dorsal (28) and lateral view (29); apex of penis, dorsal (30, 32, 34) and lateral view (31); glans penis, lateral (33, 35) and dorsal view (36-38). - Scale lines 1.0 mm (28, 29), 0.1 mm (30-38).

A retroventral proximal hump on the palpal tibia is distinct in most specimens (Figs 48, 50), less pronounced in the ♀ from Chenderiang, and indistinct in ♂♂ and ♀♀ from Kuala Lumpur and Ulu Gombak (Figs 51, 52).

The ♀♀ from Padang Gerus, Maxwell Hill and the Cameron Highlands, as well as the ♂ from "Perak" (without exact locality), are all more than 8 mm long and thus distinctly larger than the other specimens. Specimens of the northern populations appear to be generally larger in size than those of the southern populations.



FIGS 39-54

Oncopus malayanus sp. n.: ♂ holotype from Pangkor Island (45, 48); ♂ paratypes from Perak (39), Ulu Gombak (40), Kuala Lumpur (41, 51), Pangkor Island (42); ♀ paratypes from Pangkor Island (43, 46, 53), Cameron Highlands (44), Kuala Lumpur [1st ♀ (47, 52, 54), 2nd ♀ (49)], Maxwell Hill (50). - Anterior part of body, lateral view (39-44); left chelicera (45-47; arrows pointing to prodorsal subproximal hump of second article) and left palp (48, 49 deformed), retrolateral view; trochanter to tibia (50), patella and tibia (51), and trochanter and proximal part of femur (53) of left palp, retrolateral view; right leg III (deformed), retrolateral view (54). - All scale lines 1.0 mm.

Remark. The 2 ♀ from Kuala Lumpur possess crippled limbs: in one of them the right leg III has an elongated tarsus attached to the femur (Fig. 54), in the other ♀ the shortened palpal tarsus is joined directly to the palpal femur (Fig. 49).

Relationships. Oncopus malayanus sp. n. is most closely related to *O. feae.*

Distribution. This species has a relatively wide distribution in the western central part of Peninsular Malaysia [Fig. 1 (3-8)]. The immature specimens (not examined) recorded by Suzuki (1983: 2) from the Templer Park [near Kuala Lumpur; Fig. 1 (8)] and from the Pasoh Forest [near Simpang Pertang; Fig. 1 (9); Suzuki, 1976: 9-12, figs 1-2] presumably also belong to this species.

THE *TRUNCATUS*-GROUP

Diagnosis. Large to very large species (6.2-10.8 mm body length) with interocular areas not (or only slightly) forward-inclined and without paramedian tubercles on opisthosomal area VIII of dorsal scutum; palps characteristically modified: femora with more or less distinct subdistal ventral bulge, patellae with proventral process, tibiae very short; penes with widened apex (giving them the shape of a screwdriver) and one or two terminal setae on each side of straight distal margin.

This species group is close to the *feae*-group and comprises three species (*O. truncatus*, *O. tiomanensis* sp. n., *O. lingga* sp. n.) from southern Peninsular Malaysia, Singapore and from two Indonesian islands in the Lingga Archipelago.

Oncopus truncatus Thorell, 1891 Figs 55-91

Oncopus truncatus Thorell (1891: 764-765); description of juvenile. - Pocock (1897: 286, 288). - Roewer (1923: 58-59). - Roewer (1927: 267). - Sørensen (1932: 209). - Bristowe (1976: 9).

Oncopus acanthochelis Roewer (1915: 127, fig. 71), **syn. n.**; description of ♀. - Roewer (1923: 60, fig. 63). - Martens (1986: fig. 7); illustration of an oncopodid penis, without indication as to which species it belongs. - Schwendinger (1992: 194, figs 91-97, pl. 2).

Type. SINGAPORE, juvenile holotype of *O. truncatus* (MSNG, examined), leg. L. M. D'Albertis, IX.1874.

Other material. SINGAPORE: 1 ♀, holotypus of *Oncopus acanthochelis* (SMF 1256) with label "*Oncopus acanthochelis*, Type, 1 ♂", no name of collector, no date; 1 ♂, 1 ♀ (SMF 298/1) with label "*Oncopus truncatus*, 2 Exempl., Roewer det. 1926", no name of collector, no date; 1 ♂, 1 ♀ (SMF 2113/7) with label "*Oncopus acanthochelis*, 2 ♂, Roewer det. 1930", no name of collector, no date; 1 ♂ (MCZ 37715), 1 ♀ (MCZ 37716), leg. Y. M. Wang, VIII.1965; Bukit Timah Nature Reserve, 4 ♂, 4 ♀ (MAR 2140), leg. D. H. Murphy, III.-VIII.1967 (pitfall traps); 7 ♂, 7 ♀ (MAR 2141), leg. D. H. Murphy, XI.1965, III.-VIII.1967 (pitfall traps); 1 ♂, 1 ♀ (both fragmented, MAR), 1 ♀ (MHNG), leg. S. Huber, 1999; 1 ♀ (CCD), leg. C. Deeleman-Reinhold, 21.II.1983; SE Bukit Timah N. R., Rifle Range Road, 50 m, 1 ♂, 1 juvenile (MHNG SBH-96/3), 1 juvenile (MHNG SBH-96/2), 20.XI.1996, leg. B. Hauser; Labrador Hill, 40 m, 1 ♀, 1 juvenile (MHNG Sar-87/1), leg. B. Hauser, 21.XI.1987; NNW of MacRitchie Reservoir, 60 m, 1 ♀ (MHNG SBH-96/5), 21.XI.1996, leg. B. Hauser; Singapore Island Country Club, W of MacRitchie Reservoir, 20 m, 1 ♀, 2 juveniles (MHNG SL/SI-93/4), leg. B. Hauser, 23.VII.1993. MALAYSIA (peninsula), Johor, Gunung Pulai (SW of Kulai), 3 ♂, 1 ♀, 3 juveniles (RFS 2001.2241; 1 ♂ donated to the MHNG), no name of collector, 1935.

Diagnosis. Distinguished by: genital operculum with pronounced distal tubercle; mobile finger of chelicera with small ventroproximal process, large tooth on its cutting edge (if present) situated more proximally than tooth on cutting edge of fixed finger; palpal femur with subdistal bulge, palpal patella with wide proventral process, palpal tibia very short; ventroproximal process on palpal tibia distinct; penis with one terminal seta on each side, lateral sclerites of glans tapering.

Redescription. Very large species (7.5-10.8 mm long). Carapace region of dorsal scutum in ♂♂ (Figs 69, 70, 72-74) more elevated than in ♀♀ (Figs 75, 76), interocular area low, not or only slightly forward-inclined; low median longitudinal keel present on anterior areas of opisthosomal region and small paramedian pairs of tubercles present on areas V-VII (Fig. 70). Anteroproximal apophysis of coxa II scale-like, basally constricted; small process posterior to it and small anteroproximal process on coxa III. Genital operculum longer than wide, with distinct ventrodistad tubercle (Figs 71, 91).

Chelicerae robust, in ♂♂ (Figs 77-81) stronger than in ♀♀ (Figs 83, 84), with truncate or bifid retroventral tubercle and pointed, forward-inclined prolateral distal process on first article; ventral side of second cheliceral article with distal process; mobile finger of cheliceral hand with more or less pronounced subbasal process; cutting edge of each cheliceral finger in ♂♂ with strong tooth (worn in old ♂♂, Figs 77, 78; indistinct in ♀♀, Figs 83, 84), the one on the mobile finger situated at the same position as (Figs 79, 80), or more proximally than (Fig. 81) the one on the fixed finger.

Pedipalps (Figs 86-89) with short digitiform ventral process on trochanter, with more or less distinct ventroproximal process and distinct subdistal ventral transversal bulge on femur, and with pointed distad-inclined pro- and retrolateral distal processes and low rounded proximal retroventral hump on conspicuously short tibia (Fig. 86); palpal patella with wide proventral process in ♂♂ (Fig. 87; weaker in ♀♀).

Legs: femur of leg II with distinct dorsoproximal tubercle, femur IV with distinct ventroproximal one (see Schwendinger, 1992: figs 96, 97).

Penis (Figs 55-68) fairly slender, markedly widened between glans and apex, with straight or slightly rounded distal margin carrying one terminal seta on each side; glans narrower than truncus at that point (slightly wider when lateral sclerites pressed sideward on temporary slide; see Figs 57, 61), flanked by two to three setae on each side; lateral sclerites with wrinkles on lower side, tapering, slightly bent outwards and away from the truncus; median plate broadly V-shaped, distally rounded; membranous tubes long, protruding far beyond median plate.

Variation. Measurements (♂, in parentheses ♀): body 8.71-10.74 (7.42-9.11) long, 4.42-5.38 (4.39-5.32) wide; carapace region 2.29-3.12 (2.07-2.41) long, 2.60-3.06 (2.82-3.50) wide; ♂ (n = 19), ♀ (n = 21).

In most ♂♂ the teeth on the cutting edges of the cheliceral fingers are small or completely absent (Figs 77, 78). As all of them also show short and blunt (sometimes broken) palpal claws, whereas all ♂♂ with pronounced cheliceral teeth also have sharply pointed palpal claws, this is presumably due to wear.

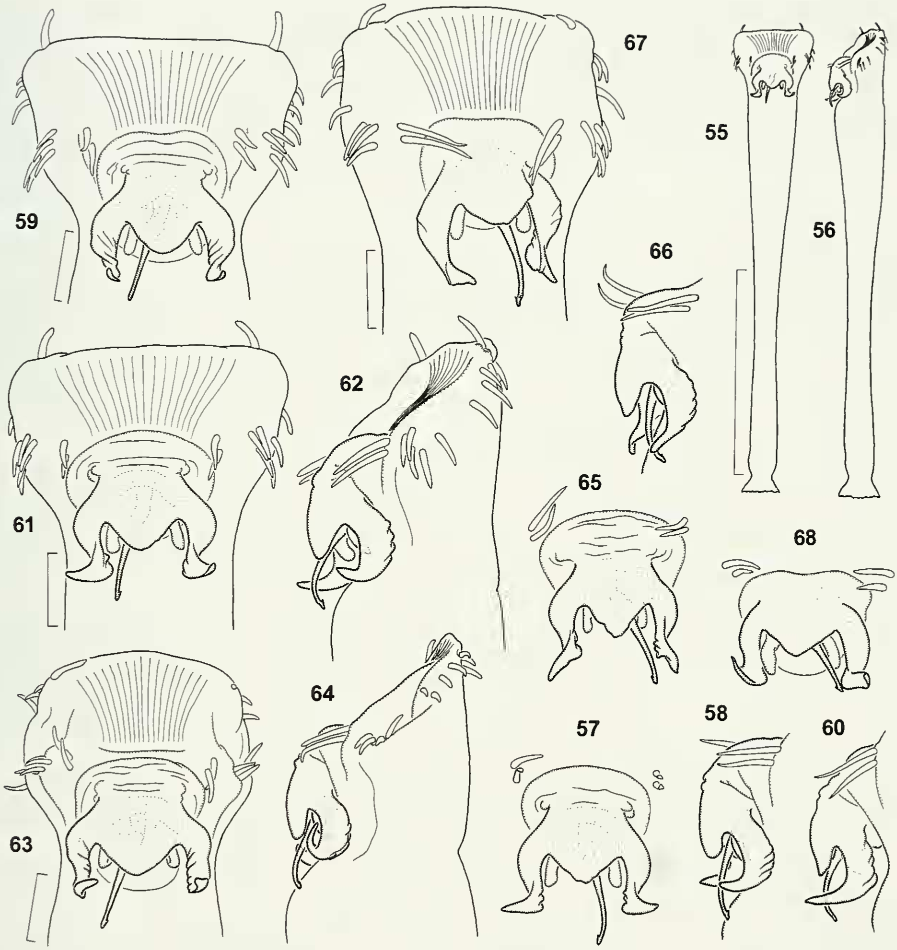
Penes have a straight or slightly arched distal margin (Figs 59, 61, 63, 67) and more or less strongly curved lateral glans sclerites (Figs 66, 60, 58, 62, 64). In most ♂♂ examined the glans penis is flanked by two setae on each side, in a single ♂ (from Singapore) by three setae (on both sides).

Remarks. The juvenile holotype (from Singapore) corresponds with *Oncopus* juveniles from the same island in all relevant characters [subbasal process on mobile cheliceral finger (Fig. 85), short palpal tibia (Fig. 90), dorso- and ventroproximal tubercle on femur II and IV, respectively]. Therefore we have no doubt that all *Oncopus* specimens from Singapore belong to the same species.

All 21 ♀ examined posses a small but distinct ventral tooth on the mobile cheliceral finger, which clearly distinguishes them from ♀♀ of the closely related *O. lingga* sp. n. (2 ♀ examined) and of O. *tioman* sp. n. (6 ♀ examined).

The larger tubercle on the genital operculum of *O. truncatus* (Fig. 91), in comparison with that of *O. lingga* sp. n., only becomes evident when specimens of both species are placed side by side.

Relationships. In its external morphology *O. truncatus* is most similar to *O. lingga* sp. n., but its penis morphology corresponds more with that of *O. tiomanensis*



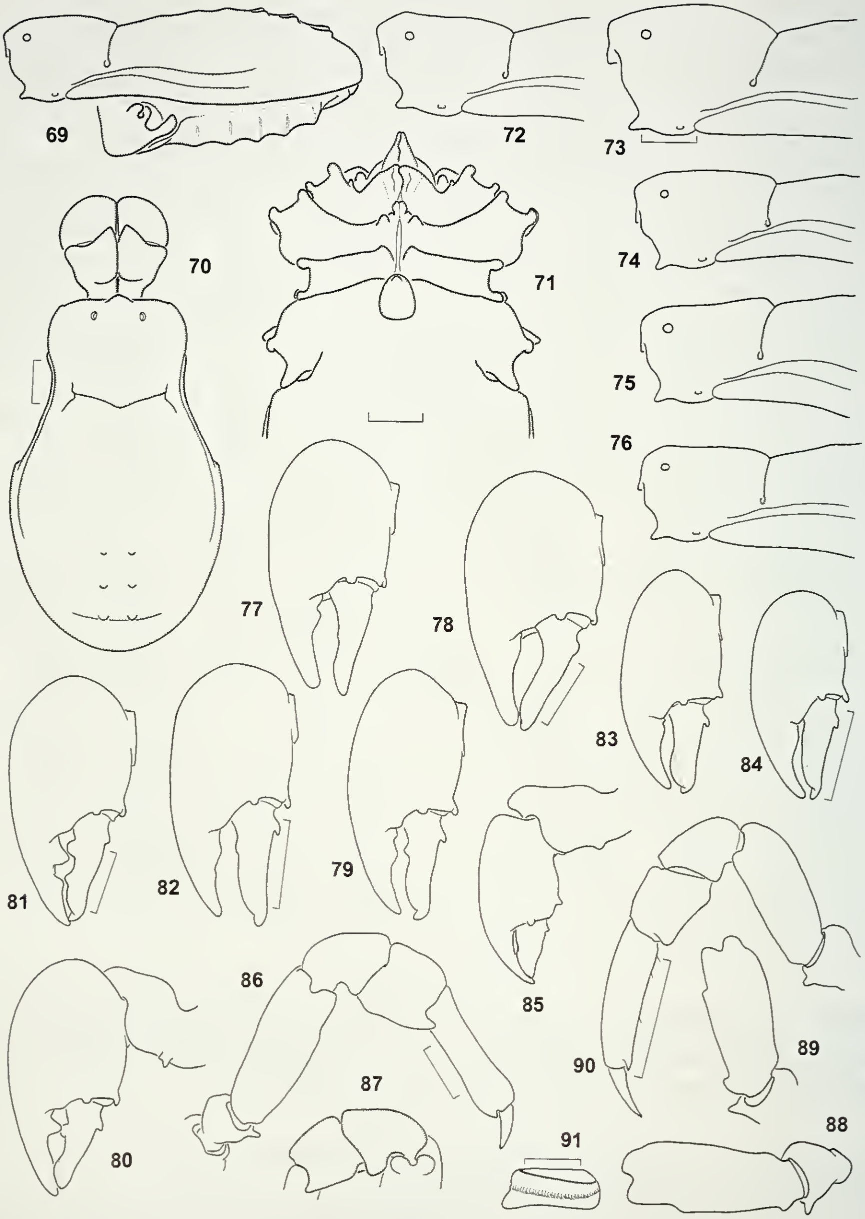
FIGS 55-68

Oncopus truncatus Thorell: 5 ♂ from Singapore [1st (55-58), 2nd (59, 60), 3rd (61, 62), 4th (63, 64), 5th (65, 66)]; 2 ♂ from Gunung Pulai (67, 68). - Penis, dorsal (55) and lateral view (56); apex of penis, dorsal (59, 61, 63) and lateral view (62, 64); glans penis, dorsal (57, 65, 68) and lateral view (58, 60, 66). - Scale lines 1.0 mm (55, 56), 0.1 mm (57-68).

sp. n. Which of them are most closely related and sister to the third species remains to be established by a character analysis later on.

Distribution and bionomics. Known from several localities on Singapore Island [Fig. 1 (13)] and from a mountain in the south of Peninsular Malaysia [Fig. 1 (12)], about 25 km northwest of Singapore. This species appears to be fairly abundant in the leaf litter of moist forests; one specimen was even collected at the base of an isolated tree on a golf course (B. Hauser, pers. commun.).

According to a casual observation during night-time by S. Huber, *O. truncatus* mates in an upright position with the ventral sides of both partners facing each



FIGS 69-91

Oncopus truncatus Thorell: juvenile holotype (85, 90); ♂♂ from Singapore (69-74, 77-80, 86-88, 91); 2 ♂ from Gunung Pulai (81, 82); ♀♀ from Singapore (75, 76, 83, 84, 89). - Body, lateral (69) and dorsal view (70); anterior part of body, ventral (71) and lateral view (72-76); left cheliceral hand, retrolateral view (77-85), right (86) and left palp (90), retrolateral view; patella and tibia of right palp, prolateral view (87); trochanter and femur of left palp, retrolateral view (88, 89); genital operculum, lateral view (91). - Scale lines 1.0 mm (69-90), 0.5 mm (91).

other, similar to theraphosid spiders. This is the only existing observation on the mating behaviour of oncopodids. These animals are very sensitive to light and air movement, and either freeze or run for cover upon the slightest disturbance.

Oncopus truncatus (and other oncopodids as well) appears to be long-lived: a pair of mature specimens was fed with living termites and kept alive for more than two years (S. Huber, pers. commun.).

Oncopus tiomanensis sp. n. Figs 92-112

Material. MALAYSIA (peninsula), Pahang, Tioman Island, 2 km SE of Kampung Genting (2°47'N, 104°08'E), 50-100 m, ♂ holotype (MHNG), 6 ♀ paratypes, 15 juveniles (MHNG, MAR), 23.-28.VI.2001, leg. A. Schulz & K. Vock; Tioman Island, at the foot of Gunung Kajang (2°47.181'N, 104°07.892'E), 160 m, 1 ♂ (matured 10.VIII.2002), 1 ♀ paratypes (MHNG), 2.X.2001, leg. L. Monod.

Etymology. The specific epithet refers to the island where the new species was found.

Diagnosis. Similar to *O. truncatus*, distinguished by: smaller in size; no process on mobile finger of chelicerae; cutting edges of cheliceral fingers in ♂♂ without prominent teeth; palps with subdistal-ventral bulge of femur and proventral process of patella less developed; carapace region of ♂♂ not more elevated than in ♀♀, interocular area not directed forward; paramedian tubercles on dorsal scutal areas V-VII less pronounced; genital operculum much wider, without anterior tubercle; dorsoproximal tubercle on femur II and ventroproximal tubercle on femur IV much shorter; penis with almost quadrangular apex, separated from rest of truncus by a more abrupt constriction at height of glans.

Description. ♂ (holotype). Coloration: body reddish amber, carapace region, chelicerae and palps mottled with dark; dorsal scutum with dark margin and dark opisthosomal areas; proximal article of chelicerae and legs dark brown, except for light amber leg tarsi and distal portion of metatarsi; tarsi I and II cream. Ventral side of body and distal articles of chelicerae yellowish amber.

Carapace region of dorsal scutum fairly low, not arched, interocular area low, rounded, not projecting beyond carapace front margin (Fig. 98). Opisthosomal areas of dorsal scutum indistinctly elevated in posterior part, with pair of small paramedian tubercles on areas VI-VII (Figs 98, 99); ventral scutal areas moderately keeled, with transversal bands of white enclosures (Fig. 98). Palpal coxa with long, conical ventral process; ventral side of leg coxa I with small anterolateral process and knob-shaped central tubercle; coxa II with scale-like anteroproximal apophysis and with low, rounded process posterior to it; posteroproximal process of coxa II absent; anteroproximal process on coxa III indistinct. Genital operculum rounded, clearly wider than long, without distoventral tubercle (Fig. 100).

Chelicerae (Fig. 106) strong; proximal article with conical retroventral tubercle and with anteriad-inclined prodorsal boss extending into rounded dorsomedian boss; second article with small ventrodistal process; mobile finger without ventral process, its inner side with sharp cutting edge only in distal half (presumably worn in proximal half); both cutting edges of cheliceral hand without prominent teeth.

Palps (Figs 109, 110): trochanter with small, slightly distad-inclined ventral process; ventral side of femur with indistinct subdistal bulge and indistinct proximal process; patella with widely rounded proventral process (Fig. 110); tibia with low retroventral proximal hump.

Legs 3142; low rounded hump present dorsoproximally on femur II and ventroproximally on femur IV.

Penis (Figs 92-95): truncus fairly slender, more or less continually widening from base to height of glans, there abruptly widening to subquadrangular apex; distal margin almost straight, with single terminal seta on each side. Glans penis about as wide as truncus at that point (wider when lateral sclerites pressed sideward on temporary slide), flanked by two setae on each side; lateral sclerites slender, with pointed tips bent outwards and upwards; median plate broadly rounded, widely V-shaped; membranous tubes long, protruding far beyond median plate.

♀. As the ♂, but interocular area slightly more raised (Fig. 102), ventral scutal areas not elevated; chelicerae weaker (Fig. 108); palps weaker, subdistal bulge on ventral side of femur (Fig. 111) and proventral process on patella (Fig. 112) less developed.

Measurements. ♂ holotype (♀ in parentheses): body 6.25 (6.18) long, 3.56 (3.63) wide; carapace region 1.75 (1.53) long, 2.32 (2.15) wide. - Palp and legs:

	Tr	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.74 (0.65)	1.63 (1.23)	1.01 (0.79)	0.64 (0.49)	- -	1.68 (1.38)	5.70 (4.54)
Leg I	0.67 (0.62)	2.03 (1.78)	1.04 (0.91)	0.89 (0.84)	1.80 (1.53)	0.49 (0.40)	6.92 (6.08)
Leg II	0.86 (0.79)	2.82 (2.47)	1.33 (1.19)	1.73 (1.51)	2.96 (2.42)	0.49 (0.40)	10.19 (8.78)
Leg III	0.69 (0.62)	1.75 (1.58)	1.01 (0.91)	0.89 (0.84)	1.88 (1.58)	0.49 (0.40)	6.71 (5.93)
Leg IV	0.89 (0.79)	2.47 (2.22)	1.43 (1.31)	1.63 (1.48)	3.06 (2.67)	0.59 (0.47)	10.07 (8.94)

Variation. Measurements of ♂ (of ♀ in parentheses): body 6.25-6.37 (5.88-6.67) long, 3.51-3.56 (3.41-3.98) wide; carapace region 1.75-1.78 (1.48-1.68) long, 2.17-2.32 (2.07-2.27) wide; ♂ (n = 2), ♀ (n = 7). The ♂ paratype has (like the ♀♀) a slightly more raised interocular area (Fig. 101) than the holotype. The cutting edges of its cheliceral hand appear less worn than in the holotype but they also carry no prominent teeth (Fig. 107).

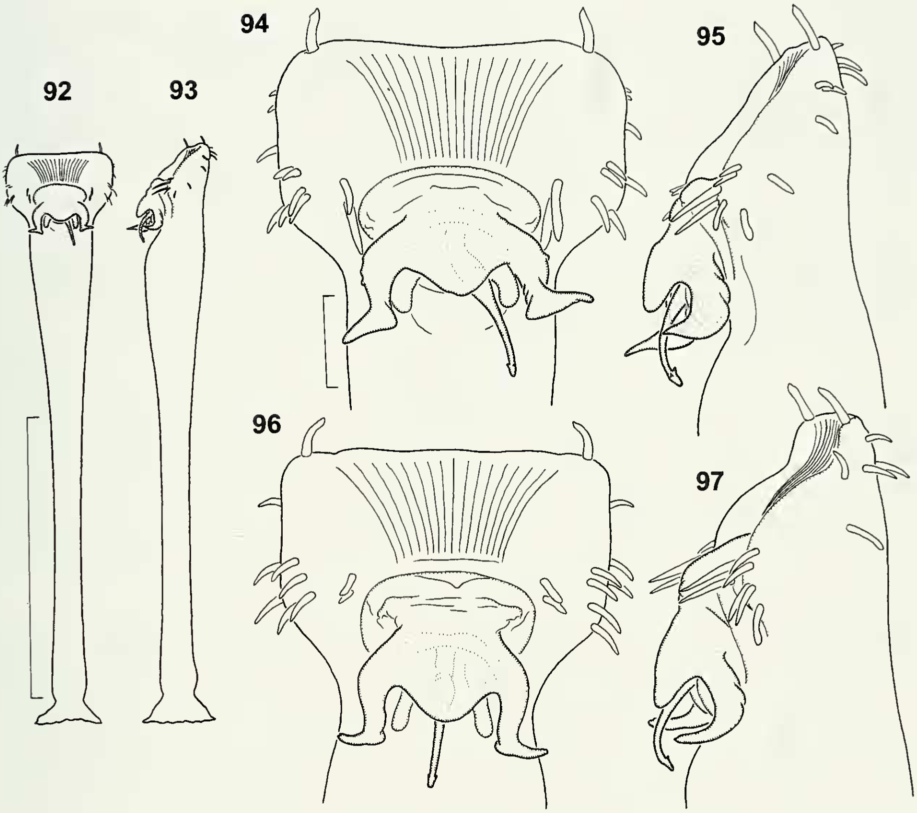
Remark. The right leg IV of the holotype is crippled; only a stump-like trochanter is present.

Relationships. External and genital characters show that *O. tiomanensis* sp. n. belongs to the *truncatus*-group and that it probably is more closely related to *O. truncatus* (more congruence in penis details) than to *O. lingga* sp. n.

Distribution. Known only from Tioman Island, off the southeastern coast of Peninsular Malaysia [Fig. 1 (11)].

Oncopus lingga sp. n. Figs 113-131

Material. INDONESIA, Riau Province, Lingga Archipelago, Lingga Island, near waterfall ca. 7 km N of Daik (0°08'53.3"S, 104°36'13.2"E), 60 m, ♂ holotype (MHNG), leg. P. J. Schwendinger, 15.VI.2001; Singkep Island, Batu Ampar Waterfall, ca. 10 km NW of Dabo (0°29'30.9"S, 104°28'31.4"E), 80 m, 2 ♀ paratypes, 2 juveniles (MHNG), leg. P. J. Schwendinger, 17./18.VI.2001.



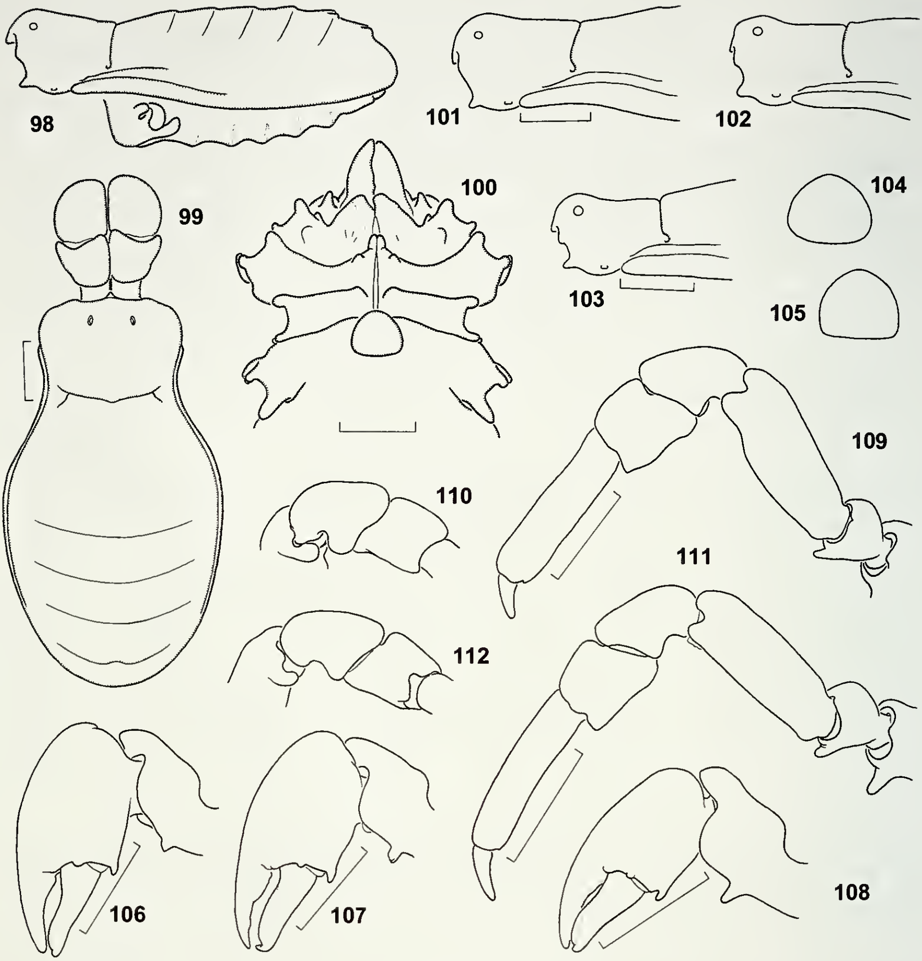
Figs 92-97

Oncopus tiomanensis sp. n.: ♂ holotype (92-95); ♂ paratype (96, 97). - Penis, dorsal (92) and lateral view (93); apex of penis, dorsal (94, 96) and lateral view (95, 97). - Scale lines 1.0 mm (92, 93), 0.1 mm (94-97).

Etymology. The specific epithet (a noun in apposition, hence invariable) refers to the archipelago in which the new species occurs.

Diagnosis. Close to *O. truncatus*, distinguished by: mobile finger of cheliceral hand ventrally with low mound instead of prominent tooth, dorsal and ventral proximal tubercles on leg II and IV smaller, tubercle near distal margin of genital operculum smaller. ♂ with more elevated interocular area, without subdistal ventral bulge on palpal femur, with stronger proventral process on palpal patella, and with large rounded tooth on cutting edge of mobile cheliceral finger situated more distally than tooth on cutting edge of fixed finger. Penis distinguished by two terminal setae on each side of distal margin; glans with wide, W-shaped median plate.

Description. ♂ (holotype). Coloration: body amber, with dark margin around dorsal scutum and dark transversal bands on its opisthosomal elevations (medially connected by dark transversal stripe); dark reticulations in carapace region and on chelicerae (proximal article darker than hand); legs and palps dark amber, except for light amber tarsi and distal part of metatarsi.



FIGS 98-112

Oncopus tiomanensis sp. n.: ♂ holotype (98-100, 106, 109-110); ♂ paratype (101, 104, 107); 2 ♀ paratypes (102, 103, 105, 108, 111, 112). - Body, lateral (98) and dorsal view (99); anterior part of body, ventral (100) and lateral view (101-103); genital operculum (104, 105); left chelicera, retrolateral view (106-108); left palp, retrolateral view (109, 111); patella and tibia of left palp, prolateral view (110, 112). - All scale lines 1.0 mm.

Carapace large and elevated, interocular area a low rounded hump (Fig. 117). Opisthosomal areas of dorsal scutum indistinctly keeled, with indistinct longitudinal median keel extending over anterior areas and with pair of paramedian tubercles on areas V-VII (increasing in size towards rear) (Fig. 118); areas of ventral scutum strongly keeled, with indistinct transversal bands of white enclosures (Fig. 117). Palpal coxa with large ventral process; ventral side of leg coxa I with anterolateral and central processes; coxa II with scale-like anteroproximal apophysis and rounded process posterior to it; coxa III with triangular anteroproximal process. Genital operculum distinctly longer than wide, with small tubercle near anterior margin (Fig. 119).

Chelicerae (Figs 124, 125) massive; proximal article with two-headed retroventral tubercle and anteriad-inclined prodorsal boss; second article with small ventrodistal tubercle, mobile finger with indistinct ventral hump on proventral face; large rounded tooth on cutting edge of mobile finger situated more distally than large conical tooth on cutting edge of fixed finger.

Palps (Figs 128-130) robust; trochanter with small ventral process; femur unarmed; patella with large subquadrangular proventral process (Figs 129, 130); tibia short, with low retroventral process near its base; tarsus subdistally widened (Fig. 128).

Legs 3142; femur II with dorsoproximal and femur IV with ventroproximal tubercle.

Penis (Figs 113-116): truncus fairly slender, with subbasal constriction, continually widening in distal half, slightly constricted at height of glans, widened at apex; distal margin straight, with two setae on each side. Glans penis narrower than truncus at that point; lateral sclerites pointed, bent outwards and away from the truncus; median plate wide, indistinctly W-shaped; membranous tubes long, distinctly protruding beyond median plate.

♀. As the ♂, but smaller, carapace region less elevated and shorter, ventral scutal areas less elevated (Figs 120, 123); chelicerae weaker, teeth on their cutting edges smaller (Figs 126, 127); ventral side of palpal femur with small proximal process and indistinct subdistal bulge, patella with smaller proventral process (Fig. 131); legs 3124.

Measurements. ♂ holotype (♀ in parentheses): body 7.93 (7.00) long, 4.75 (4.04) wide; carapace region 2.75 (1.98) long, 3.30 (2.47) wide. - Palp and legs:

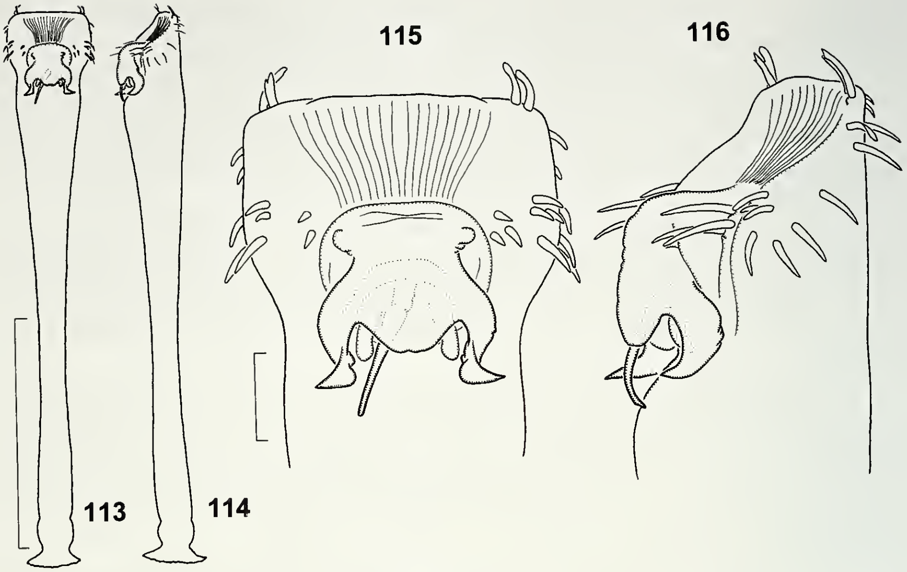
	Tr	Fe	Pa	Ti	Mt	Ta	Total
Palp	1.17 (0.80)	2.72 (1.54)	1.48 (0.93)	1.08 (0.68)	- -	2.28 (1.60)	8.73 (5.55)
Leg I	0.86 (0.68)	3.02 (2.10)	1.30 (1.64)	1.33 (1.64)	2.62 (1.82)	0.52 (0.40)	9.65 (8.28)
Leg II	1.17 (0.80)	3.95 (2.90)	1.73 (1.36)	2.41 (1.79)	4.01 (2.80)	0.49 (0.43)	13.76 (10.08)
Leg III	0.86 (0.74)	2.41 (1.88)	1.36 (1.08)	1.23 (0.99)	2.69 (1.94)	0.56 (0.52)	9.11 (7.15)
Leg IV	1.17 (0.93)	3.27 (2.59)	1.94 (1.48)	2.31 (1.82)	3.55 (3.15)	0.49 (0.56)	12.73 (10.53)

Variation. The second ♀ measures: body length 7.19, width 4.16; carapace length 1.98, width 2.59.

Remarks. As the ♀♀ examined are clearly smaller than the ♂ holotype and were collected from a different island, it is possible that they are not conspecific. On the other hand, they appear to be sufficiently distinct from ♀♀ of *O. truncatus* and therefore we regard them as belonging to *O. lingga* sp. n.

The ♂ holotype was collected immediately after its final moult (when the body was still unpigmented) and then kept in captivity for a few weeks; its cheliceral cutting edges and palpal claws therefore show no signs of wear.

Living mature specimens have a clearly visible white membrane dorsally between the proximal and second cheliceral article (Figs 118, 121), though this becomes less distinct in alcohol.



FIGS 113-116

Oncopus lingga sp. n.: ♂ holotype. - Penis, dorsal (113) and lateral view (114); apex of penis, dorsal (115) and lateral view (116). - Scale lines 1.0 mm (113, 114), 0.1 mm (115, 116).

Relationships. The new species is most closely related to *O. truncatus*. Both species share a similar penis morphology and a very similar external morphology (e.g., short palpal tibia; pronounced proventral process on palpal patella of males; subdistal ventral bulge on palpal femur of females; dorsoproximal and ventroproximal tubercle on femur of leg II and IV, respectively; anterior tubercle on genital operculum). *Oncopus tiomanensis* sp. n. is phylogenetically more distant from *O. lingga* sp. n.

Distribution. Known only from two islands (separated from each other by less than 10 km) south of the Malayan Peninsula [Fig. 1 (14, 15)]. This species and a presumably undescribed one from southern Kalimantan (see "Unidentified material") are the only *Oncopus* occurring south of the equator.

THE *DORIAE*-GROUP

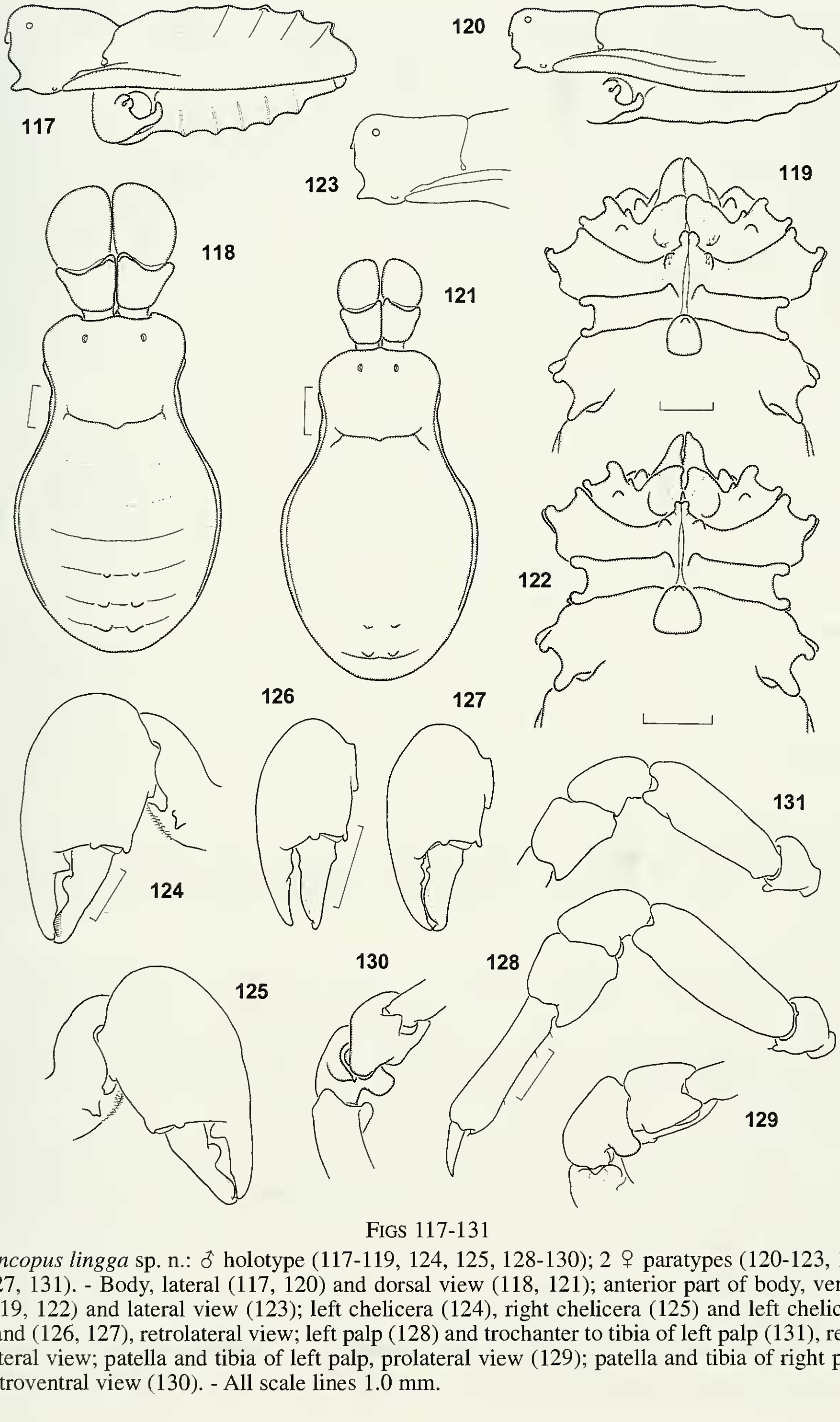
Diagnosis. See diagnosis of *O. doriae*.

At present this species group contains only a single species, *O. doriae*, from the western part of Sarawak. This species appears to be more closely related to the *feae*-group and the *truncatus*-group from the Malayan Peninsula and nearby islands than to congeners from northeastern Borneo.

Oncopus doriae Thorell, 1876 Figs 132-151

Oncopus doriae Thorell (1876: 135-138); description of ♀. - Thorell (1891: 764-765, figs 31-36). - Pocock (1897: 288). - Roewer (1923: 57-58, fig. 60). - Bristowe (1976: 9). - Sørensen (1932: 209). - Schwendinger (1992: 197).

Oncopus alticeps Pocock (= *O. feae* Thorell). - Roewer (1923: 60); misidentification of specimen SMF 1261.



FIGS 117-131

Oncopus lingga sp. n.: ♂ holotype (117-119, 124, 125, 128-130); 2 ♀ paratypes (120-123, 126, 127, 131). - Body, lateral (117, 120) and dorsal view (118, 121); anterior part of body, ventral (119, 122) and lateral view (123); left chelicera (124), right chelicera (125) and left cheliceral hand (126, 127), retrolateral view; left palp (128) and trochanter to tibia of left palp (131), retrolateral view; patella and tibia of left palp, prolateral view (129); patella and tibia of right palp, retroventral view (130). - All scale lines 1.0 mm.

Types. MALAYSIA (east), Sarawak, 1 ♀, 1 juvenile syntypes (MSNG, examined), leg. G. Doria & O. Beccari, 1866; ♀ here designated lectotype in order to preserve stability of nomenclature.

Other material. MALAYSIA (east), Sarawak, Santubong, 32 km N of Kuching, 0-100 m, 1 ♂, 1 ♀, 2 juveniles (MHNG), leg. I. Löbl & D. Burckhardt, 11.-16.V.1994; Gunung Santubong (south end), 1 ♀ (California Academy of Science), leg. J. E. Tobler, 15.IV.1970; Batu Lundu (presumably near Lundu), 1 ♀ (SMF 540/5) with label "*Oncopus doriae* Thorell, 1 Exempl., Roewer det. 1927", no name of collector, no date; Gunung Gading National Park, 300 m, NW of Lundu, 1 juvenile (MHNG), leg. S. Kurbatov, 18.X.2001; Gunung Serapi (near Matang), 320 m, 1 juvenile (MHNG), leg. B. Hauser, 9.XII.1987; Bako National Park, 2 juveniles (CCD), leg. C. Deeleman-Reinhold & P. Deeleman, 29./30.III.1985; Bako N. P., 1 juvenile (MAR), leg. A. Riedel, 27.III.1990; Balai Ringin, 40 km E of Serian, 1 juvenile (CCD), leg. C. Deeleman-Reinhold, 7.IV.1985; Gunung Penrissen, 1000 m, 2 juveniles (MHNG), leg. I. Löbl & D. Burckhardt, 23.V.1994. - THAILAND, without exact locality (dubious record), 1 ♂ (SMF 1261), fragmented specimen, with label "*Oncopus alticeps* Pocock, Siam, 1 ♂, Roewer det. 1914", no name of collector, no date.

Diagnosis. Distinguished by: interocular area forward-inclined; pair of paramedian tubercles projecting beyond posterior margin of dorsal scutum; palpal coxa with two ventral processes; mobile finger of chelicerae in ♂♂ with transversal ledge and wide ventroproximal boss; palpal femur with subdistal ventral process; penis with very large, paddle-shaped apex carrying two setae on each side of distal margin, lateral sclerites of glans distally widening, median plate long, V- or narrowly U-shaped.

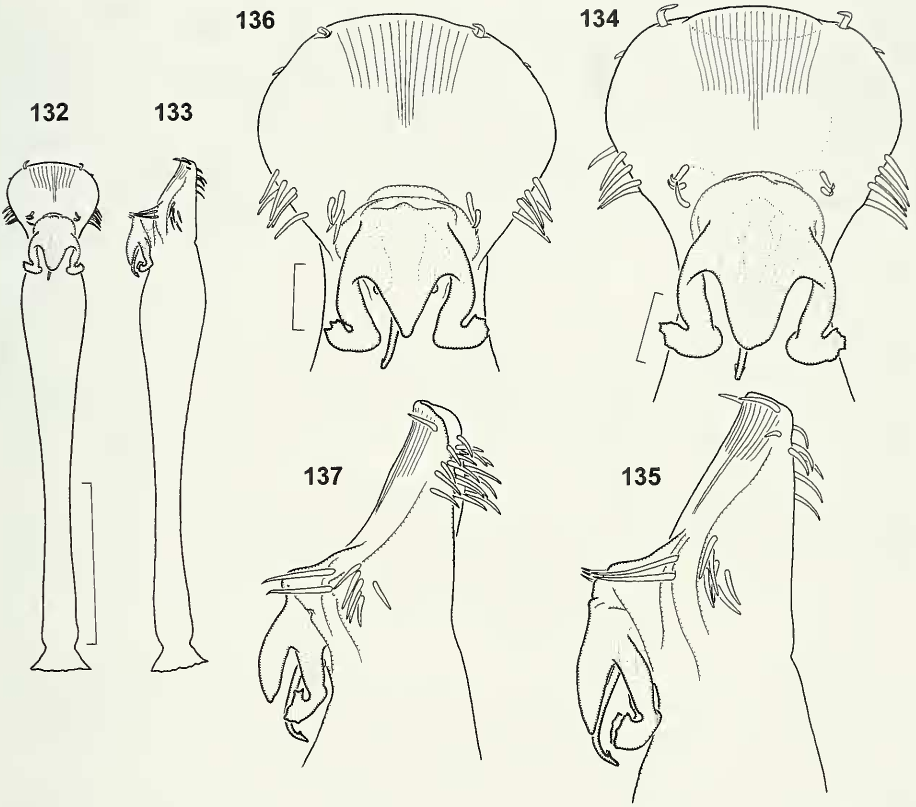
Redescription. Large species (7.1-8.4 mm long). Carapace region of dorsal scutum in ♂♂ (Fig. 138) arched and more elevated than in ♀♀ (Fig. 141), with forward-inclined interocular area, rounded in ♂♂ (Figs 138, 139), more pointed in ♀♀ (Figs 141-143); opisthosomal region of dorsal scutum with indistinct longitudinal median keel extending over areas I-III (Fig. 142) and with small paramedian pairs of tubercles on areas VI-VIII, the last pair clearly projecting beyond the posterior scutal margin (Figs 138, 139, 141, 143); palpal coxa with two pointed ventral tubercles on moderately developed common socket; leg coxa II with scale-like anteroproximal apophysis, process posterior to it developed as a hump (strongly elevated in ♂♂) gradually sloping down to the posteroproximal corner, the latter without process; anteroproximal process on coxa III indistinct; genital operculum longer than wide (Fig. 140).

Chelicerae robust, in ♂♂ (Figs 144, 145) stronger than in ♀♀ (Figs 146, 147), with rounded retroventral tubercle on first article; ventral side of second cheliceral article with strong distal process; mobile finger of chelicera in ♂♂ with broad ventral hump and with pronounced transversal ledge in proximal half of retrolateral side (Figs 144, 145; both characters absent in ♀♀); cutting edge of cheliceral fingers without marked teeth.

Pedipalps (Figs 148-151) with quite long, pointed ventral process on trochanter, with small proximal and small subdistal process on ventral side of femur (weaker in ♂♂, Figs 148, 149), and with small retroventral hump on tibia; no proventral process on palpal patella.

Legs: femur of leg II with small prodorsal proximal tubercle, femur IV without ventral tubercle.

Penis (Figs 132-137) fairly slender, gradually widening towards the apex, with constriction at height of glans; apex exceptionally long, widely paddle-shaped, with

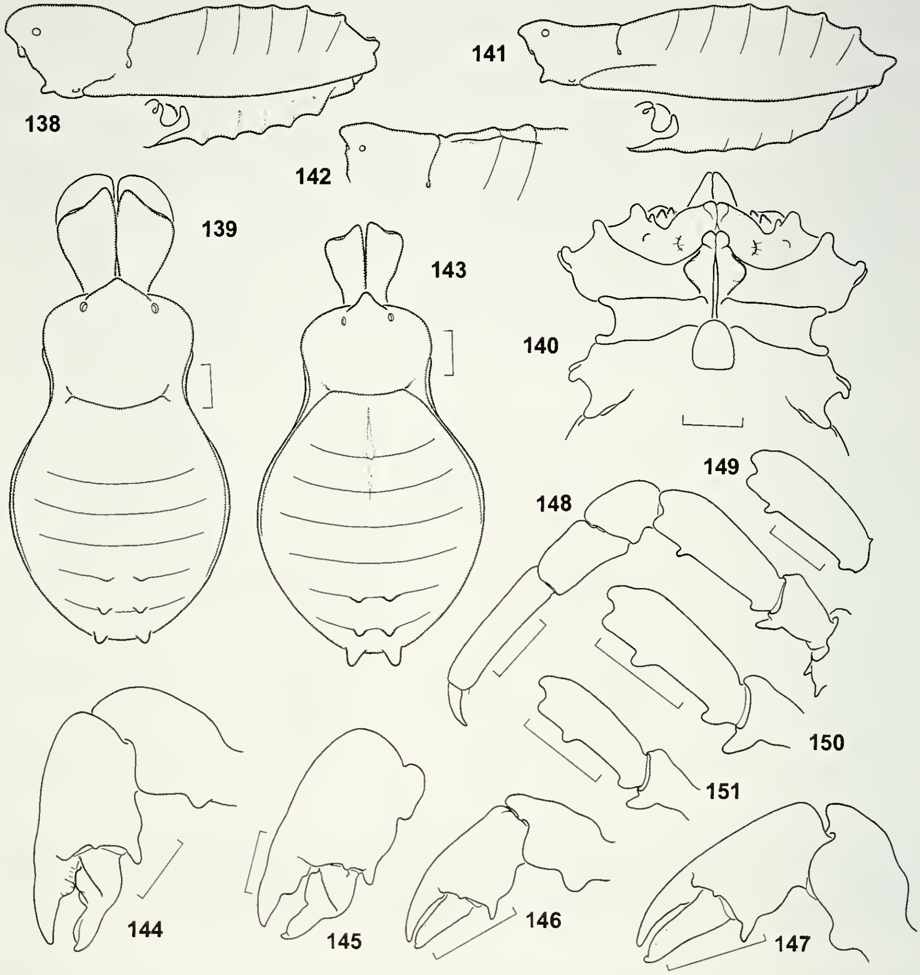


FIGS 132-137

Oncopus doriae Thorell: ♂ from Gunung Santubong (132-135); ♂ labelled as originating from Siam (136, 137). - Penis, dorsal (132) and lateral view (133); apex of penis, dorsal (134, 136) and lateral view (135, 137). - Scale lines 1.0 mm (132, 133), 0.1 mm (134-137).

broadly rounded distal margin carrying two setae on each side (distal seta arising from distal edge of truncus, more proximal seta originating from distoventral side close to edge; Figs 134, 136); glans about as wide as truncus at that point, flanked by two to three setae on each side; lateral sclerites broad, bent outwards and away from the truncus, with broadly truncate, dentate tips; median plate long and narrow, V-shaped (Fig. 136) or tongue-shaped (Fig. 134); membranous tubes short, not or only slightly protruding below median plate.

Variation. Measurements (♂, in parentheses ♀): body 7.92-8.39 (7.08-8.17) long, 4.88-5.25 (4.35-4.91) wide; carapace region 2.83-3.11 (1.93-2.27) long, 3.32-3.66 (2.48-3.07) wide; ♂ (n = 2), ♀ (n = 4). In 2 ♀ (including the lectotype) and both ♂♂ examined the median longitudinal keel on opisthosomal areas I-III is discernible in dorsolateral view (Fig. 142), in the other specimens it is not. The genital operculum of the ♀ lectotype and of one ♂ (Fig. 140) is slightly longer than wide, in the other specimens it is as wide as long or slightly wider than long. The proventral process on



Figs 138-151

Oncopus doriae Thorell: ♀ lectotype (141-143, 147, 150); ♀ (146, 151) and ♂ (138-140, 144, 148) from Gunung Santubong; ♂ labelled as originating from Siam (145, 149). - Body, lateral (138, 141) and dorsal view (139, 143); anterior part of body, ventral (140) and dorsolateral view (142); left chelicera (144, 146, 147) and left cheliceral hand (145), retrolateral view; left palp (148), trochanter and femur (150, 151) of left palp, femur (149) of left palp, retrolateral view. - All scale lines 1.0 mm.

palpal coxa is either pointed and as long as the retrolateral one, or shorter and more rounded.

Relationships. O. doriae is very distinct from all other congeners and its relationships are not clear. Judging from penis morphology, it appears that this species is more closely related to the *feae*-group (closest to *O. feae*) and to the *truncatus*-group than to *O. hosei* and *O. megachelis*.

Distribution. This species is quite widely distributed in the western part of Sarawak [Fig. 1 (17-22)]. The types presumably originate from near Kuching. Beccari and Doria collected together in this area until Doria had to return to Italy (because of deteriorating health) in March 1866 (Beccari, 1904). The ♂ with the locality label "Siam" (written by Roewer) undoubtedly belongs to *O. doriae*, but it is very unlikely that this species occurs in western Sarawak and in Thailand and seemingly nowhere else in between. Therefore we assume that Roewer has added an incorrect label (see also the paragraph "Distribution" under *O. expatriatus* sp. n.).

THE *HOSEI*-GROUP

Diagnosis. Large species (7.0-9.5 mm body length) characterized by penis morphology: distal margin of truncus sinuate, with single terminal seta on elevated socket on each side; subdistal lateral setae arranged in one or two recurved rows; lateral sclerites of glans basally with knee-like lateral projections (as seen in dorsal view); median plate very wide.

This species group contains three species (*O. hosei*, *O. megachelis*, *O. expatriatus* sp. n.), presumably all from the northeastern part of Borneo (record of *O. expatriatus* sp. n. from Thailand dubious). Relationships remain unclear; in penis morphology these species are very distinct from all other congeners.

Oncopus hosei Pocock, 1897 Figs 152-158

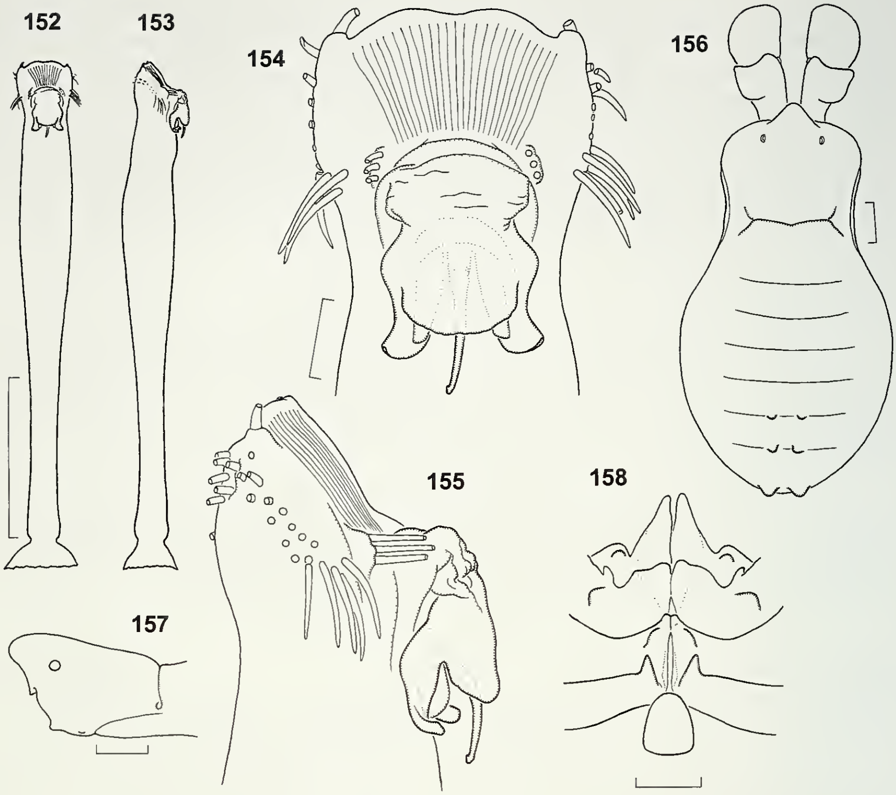
Oncopus hosei Pocock (1897: 285-287, fig. 1); description of ♂. - Roewer (1923: 59, fig. 61). - Bristowe (1976: 9). - Schwendinger (1992: 194-196, figs 98-101).

Type. MALAYSIA (east), Sarawak, Baram, ♂ holotype (NHML 1895.10.15, examined), leg. C. Hose, collected before 1895.

Other material. MALAYSIA (east), Sarawak, Lambir Hills National Park, south of Miri, 1 juvenile (MHNG), leg. S. Kurbatov, 11.-13.X.2001.

Diagnosis. Distinguished by: interocular area strongly forward-inclined; carapace region fairly low (clearly lower than in ♂♂ of *O. doriae*); paramedian tubercles on opisthosomal area VIII situated close to each other and projecting beyond posterior margin of dorsal scutum; anteroproximal process on coxa III long; mobile finger of chelicera without ventral tubercle; palpal femur without ventral process; truncus penis with one terminal seta on prominent socket on each side of distal margin, subterminal lateral setae arranged in two recurved rows; glans penis with widely rounded median plate and truncate lateral sclerites with bases bulged laterally.

Redescription. Large species (dorsal scutum of ♂ holotype 9.5 long, 5.2 wide; carapace region 2.8 long, 3.4 wide) with fairly slender body (Fig. 156). Carapace region only moderately raised, interocular area distinctly forward-inclined (Fig. 157); opisthosomal areas VI-VIII with paired paramedian tubercles, posterior ones largest, situated close to each other and projecting beyond posterior scutal margin (Fig. 156). Palpal coxa with low, rounded ventral process; leg coxa II with indistinct anteroproximal apophysis (as in *Gnomulus* species), process posterior to it developed as low bulge, posteroproximal process absent; anteroproximal process on coxa III long, pointed, triangular; genital operculum distinctly longer than wide (Fig. 158).



FIGS 152-158

Oncopus hosei Pocock: ♂ holotype. - Penis, dorsal (152) and lateral view (153); apex of penis, dorsal (154) and lateral view (155); body, dorsal view (156); anterior part of body, lateral view (157) and ventral view (158, showing only central portion). - Scale lines 1.0 mm (152, 153, 156-158), 0.1 mm (154, 155).

Chelicerae (see Schwendinger, 1992: fig. 100) robust, with low, domed retroventral process on proximal article, a small distoventral one on second article, none on mobile finger.

Palp (see Schwendinger, 1992: fig. 101) with small pointed ventral process on trochanter and with low ventroproximal hump on tibia, no process on femur.

Legs: femur of leg II with distinct dorsoproximal tubercle.

Penis (Figs 152-155): truncus fairly slender, with sinuate distal margin carrying one lateral seta on each side, each seta raised on small mound; subterminal lateral setae arranged in two more or less clearly outlined recurved rows; glans penis narrower than truncus at that point, its membranous base rounded, flanked by three setae on each side; median plate widely rounded, not covering tips of long membranous tubes; lateral sclerites with wide, rounded bases bulged sideward like "knees" and with truncate tips bent away from truncus.

Remarks. The holotype (with a pin running through its longitudinal axis) has a brittle cuticle and shows an unusually dark coloration (mentioned by Schwendinger, 1992: 194). This is possibly the result of an unusual preservation method.

The juvenile specimen is quite similar to the holotype (different only in interocular area less forward-inclined and anteroproximal process on coxa III shorter), but shows a normal (amber) coloration.

Relationships. Penis morphology shows a close relationship between *O. hosei* and *O. megachelis.* The penis of both species differ only in relatively minor details, i.e. *O. hosei* has a stouter truncus with a wider, laterally more rounded apex and narrower, distally more divergent, apically rounded lateral sclerites (Fig. 154, cf. Fig. 159).

Distribution. Known from the type locality, somewhere along the Baram River {possibly near Kuala Baram [Fig. 1 (25)]}, and from the Lambir Hills N. P. [Fig. 1 (24)], both in the northeastern part of Sarawak.

Oncopus megachelis Schwendinger, 1992 Figs 159-161

Oncopus megachelis Schwendinger (1992: 192-194, figs 81-90); description of ♂.

Types. MALAYSIA (east), Sabah, Sandakan Residency, Sepilok, Kabili-Sepilok Forest Reserve, 40 m, ♂ holotype, juvenile paratype (both in MHNG, examined), leg. B. Hauser, 10.V.1982.

Diagnosis. Large species (8.1 mm body length), similar to *O. hosei*, distinguished by: interocular area more rounded (Fig. 160); no paramedian tubercles on opisthosomal area VIII of dorsal scutum; genital operculum wider than long (Fig. 161); palpal femur with small ventroproximal process; penis stouter, its subterminal lateral setae mostly arranged in one recurved row (a few setae in the middle in two rows); lateral sclerites of glans penis narrower, more strongly bent outwards, distally rounded, bases more distinctly knee-shaped (Fig. 159).

Relationships. This species is most closely related to *O. hosei.*

Distribution. Known only from the type locality, in the eastern part of Sabah [Fig. 1 (26)].

Oncopus expatriatus sp. n. Figs 162-171

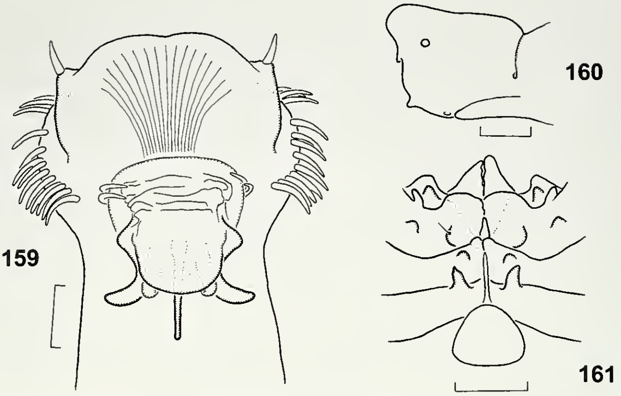
Material. THAILAND, near Bangkok (dubious record), ♂ holotype (SMF 8658/13) with label reading "*Pelitnus alticeps* Pocock, 1 ♂, Siam: bei Bangkok, Roewer det. 1940", no name of collector, no date.

Etymology. Latin participle: *expatriatus* = expatriate. The specific epithet refers to the questionable origin of the holotype.

Diagnosis. Similar to *O. megachelis*, distinguished by: interocular area less protruding; anteroproximal process of leg coxa III distinctly smaller; truncus penis stouter, slightly constricted in its middle portion, its subterminal lateral setae arranged in two rows; glans penis shorter, its lateral sclerites more strongly bent upwards and with more strongly bent knee-shaped lateral bases, its median plate with straight distal margin and strong lateral teeth.

Description. ♂ (holotype). Coloration (faded): body light amber throughout, with slightly darker markings on dorsal scutum.

Carapace region of dorsal scutum large and raised, interocular area a low rounded hump (Fig. 166). Opisthosomal areas of dorsal scutum indistinctly keeled,



Figs 159-161
Oncopus megachelis Schwendinger: ♂ holotype. - Apex of penis, dorsal view (159); anterior part of body, lateral (160) and ventral view (161, showing only central portion). - Scale lines 0.1 mm (159), 1.0 mm (160, 161).

with pairs of small paramedian tubercles on areas VII and VIII, posterior pair slightly protruding from posterior margin of scutum (Figs 166, 167); ventral scutal areas distinctly keeled, with transversal bands of white enclosures (Fig. 166). Palpal coxa with long, digitiform ventral process; ventral side of leg coxa I with distinct anterolateral and indistinct central processes; coxa II with small scale-like trapezoidal anteroproximal apophysis and with small conical process posterior to it; coxa III with small anteroproximal process. Genital operculum rounded, longer than wide (Fig. 168).

Chelicerae (Figs 169, 170) strong; proximal article with small, rounded retroventral tubercle and anteriad-inclined prodorsal boss (Fig. 170); second article with small ventrodistal tubercle, mobile finger without ventral process; cutting edge of mobile finger with conical tooth fitting between two teeth on cutting edge of fixed finger.

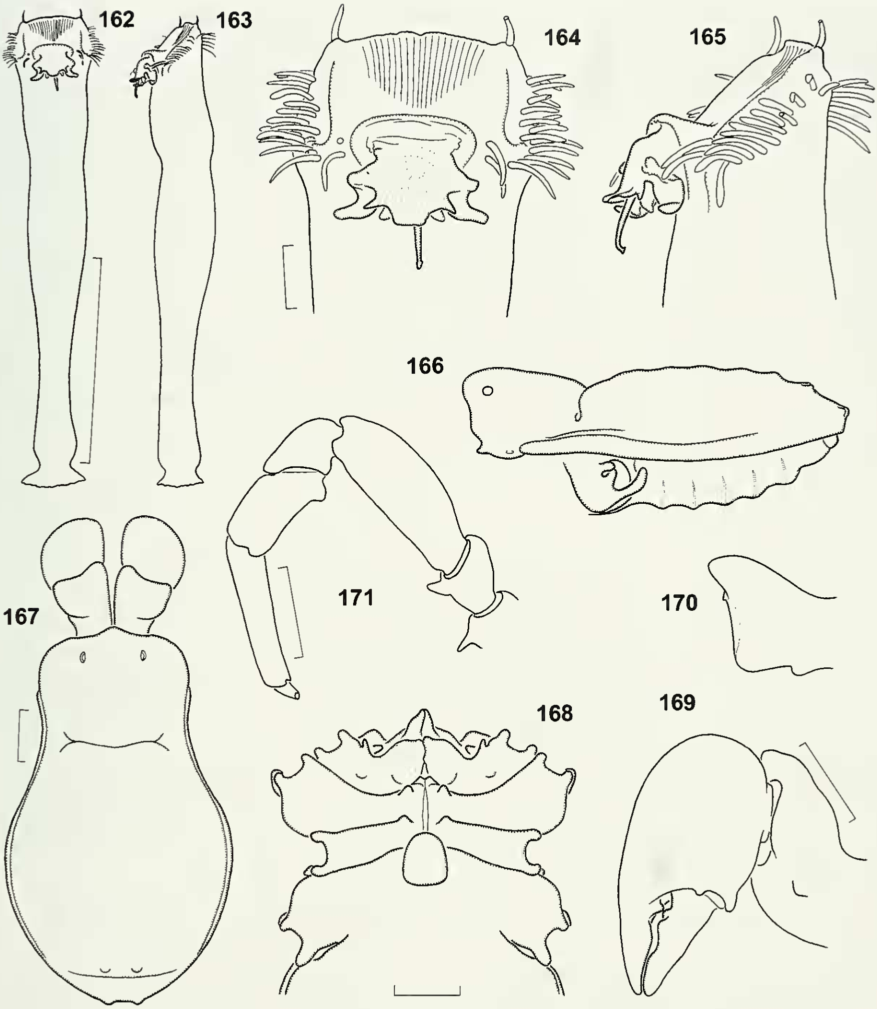
Palps (Fig. 171): trochanter with strong, distad-inclined ventral process; femur with only an indistinct ventrobasal hump, otherwise unarmed; patella without proventral process; tibia with quite large retroventral proximal process.

Legs 3124; femur II with dorsoproximal tubercle; only a low rounded hump ventroproximally on femur IV.

Penis (Figs 162-165): truncus remarkably stout, more or less continually widening from base to apex, slightly constricted after the proximal two-thirds, with subterminal lateral setae arranged in two irregular recurved rows; distal margin of truncus straight, each side with one terminal seta raised on low socket. Glans penis quite short, much narrower than truncus at that point, flanked by two setae on each side; lateral sclerites bent outwards and away from truncus, their wide bases strongly protruding laterally, their apices truncate; median plate with straight distal margin and with pair of strong lateral teeth; membranous tubes distinctly protruding beyond median plate.

♀. Unknown.

Measurements. ♂ holotype: body 7.04 long, 4.28 wide; carapace region 2.26 long, 2.83 wide. - Palp and legs:



Figs 162-171

Oncopus expatriatus sp. n.: ♂ holotype. - Penis, dorsal (162) and lateral view (163); apex of penis, dorsal (164) and lateral view (165); body, lateral (166) and dorsal view (167); anterior part of body, ventral view (168); left chelicera (169) and left palp (171), retrolateral view; proximal article of left chelicera, retrodorsal view (170). - Scale lines 1.0 mm (162, 163, 166-171), 0.1 mm (164, 165).

	Tr	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.89	1.77	0.93	0.79	-	1.77	6.15
Leg I	0.74	2.41	1.08	1.13	2.21	0.49	8.06
Leg II	0.93	3.20	1.43	1.87	3.27	0.34	11.04
Leg III	0.79	1.92	1.18	1.13	2.34	0.49	7.85
Leg IV	0.98	2.56	1.62	1.87	3.69	0.54	11.26

Remarks. The holotype has been pinned through its prosoma (not indicated in Fig. 167), but is otherwise in perfect condition.

According to Roewer's substitute label of 1940 (Roewer replaced many original labels in his collection), the holotype was collected near Bangkok, but we strongly doubt if this is correct. If so, this would be the only *Oncopus* specimen ever found in Thailand (not considering the obviously incorrectly labelled ♂ of *O. doriae* in Roewer's collection; see paragraph "Distribution" in the treatment of *O. doriae*), about 900 km away from the closest locality of another *Oncopus* (i.e. *O. feae* on Penang Island). No indication is given as to when the type was collected and by whom, and Roewer was notorious for giving inaccurate localities (see Helversen & Martens, 1972). On the other hand, strong similarities in the penes of *O. expatriatus* sp. n., *O. hosei* and *O. megachelis* indicate a close relationship between these three species, and therefore we assume that *O. expatriatus* sp. n. actually occurs in northern Borneo. We speculate that Roewer possibly has received the type from the collection of Stanley Flower, who was working at the Royal Museum of Bangkok and who also collected the type of *O. alticeps* (here placed in the synonymy of *O. feae*) (see Pocock, 1897: 287). No confirmation of this was found among Roewer's documents in the SMF (P. Jäger, pers. commun.). There is, however, an entry for this specimen (serial number 8658, tube number 13) in the collection files of Roewer, in which "Borneo" (in blue ink, as for other entries on the same page) was overwritten by "Siam" (in black ink).

In the case that the holotype of *O. expatriatus* sp. n. really originates from near Bangkok, then there is little hope that the corresponding population of this species still exists there today. Leaf litter sifting in semi-evergreen rainforest in the lowland and lower montane rainforest (terminology according to Whitmore, 1991) of Khao Yai National Park (about 90 km NE of Bangkok; the most promising locality to find oncopodids in this area) by I. Löbl & D. Burckhardt and by P.J. Schwendinger has revealed the presence of *Gnomulus*, but not of *Oncopus* (see Schwendinger & Martens, 2002: 107).

Relationships. Congruencies in genital morphology (terminal setae of truncus penis resting on sockets; subdistal lateral setae arranged in one or two curved rows; glans penis with a very wide median plate and with laterad-directed "knees" at the base of the lateral sclerites) and in external morphology (i.e. indistinctly developed antero-proximal apophysis on ventral side of leg coxa II; no ventral process on mobile finger of chelicerae) indicate a close relationship between *O. expatriatus* sp. n. and the sister species *O. megachelis* and *O. hosei.*

Distribution. According to its dubious label data, the holotype of *O. expatriatus* sp. n. was found in central Thailand [Fig. 1 (1)]. Morphological characters, however, indicate that this species actually occurs on Borneo (see remarks above).

UNIDENTIFIED MATERIAL

MALAYSIA (peninsula), Pahang, Bukit Charas [Fig. 1 (10)], 60 m, near Panching, 30 km NW of Kuantan, 1 juvenile (MHNG), leg. P.J. Schwendinger, 8.VII.2001. This specimen possibly belongs to *O. malayanus* sp. n.

MALAYSIA (east), Sarawak, confluent of Suan Oyan and Mujong rivers [Fig. 1 (23)], 150m, east of Kapit, 1 juvenile (MHNG), leg. I. Löbl & D. Burckhardt, 19.V.1994. This quite small specimen does not show the characteristics of *O. doriae* and of *O. hosei*; it possibly belongs to an undescribed species.

INDONESIA, Kalimantan, East Kalimantan, from a degraded rainforest near Sepaku [Fig. 1 (28)], 40 km NNW of Balikpapan, 1 juvenile (MAR), leg. C. Deeleman, 2.-5.III.1980. This specimen is similar to juveniles of *O. doriae*, but it possesses no subdistal ventral process on the palpal femur.

INDONESIA, Kalimantan, East Kalimantan, Samarinda District, Sangasanga Muara [Fig. 1 (27)], 4 juveniles (ZMT), leg. P. Lehtinen. These specimens appear to be conspecific with the previous one.

INDONESIA, Sumatra, West Sumatra Province, off the road Pematangsiantar - Prapat, 18 km from Prapat [Fig. 1 (16)], 980 m, 1 juvenile (MHNG), leg. B. Hauser, 8.XI.1985. This is the only known record of *Oncopus* from Sumatra Island. In the course of that journey (Sum-85) B. Hauser also collected in Singapore, but a confusion of localities can be ruled out. This fairly large specimen from Sumatra is distinct from all other *Oncopus* juveniles examined in that it possesses a light median longitudinal stripe on the anterior part of the dorsal scutum, running from the carapace front margin to opisthosomal area III. No such pattern is present in the *O. truncatus* juveniles examined from Singapore. Some small juveniles of *O. doriae* (not all of them and not the large juveniles) also possess a median longitudinal stripe over the carapace region, but it is less pronounced, narrower and not extending onto the anterior opisthosomal areas.

DISCUSSION

TAXONOMIC CHARACTERS AND RELATIONSHIPS

Bristowe (1975) was so impressed by the external morphology of the *O. feae* ♀ he found on Penang Island that he proposed a new suborder, Oncopodines, for the family Oncopodidae. This was obviously done in ignorance of the fact that the same one-sided interpretation (not taking genitalia into consideration) of oncopodid morphology has earlier led Šilhavý (1961) to establish the suborder Oncopodomorphi. On the basis of plesiomorphic similarities in external morphology with the Cyphophthalmi, both authors considered the Oncopodidae as a primitive group at the base of the opilionid system. It was not until genital morphology in opilionids became better known that this view changed considerably. The studies of Martens and collaborators (Martens, 1976, 1980, 1986; Martens *et al.*, 1981) showed that oncopodids are actually a highly evolved branch within the Laniatores. This was corroborated by an analysis of morphological and molecular data by Giribet *et al.* (2002) and by our investigations on the penis morphology of all known oncopodid species (Schwendinger, 1992; Martens & Schwendinger, 1998; Schwendinger & Martens, 1999, 2002a, b and this paper).

Oncopus species possess several characters which seem to be apomorphic within the family, i.e. large body size, massive chelicerae with a ventral process on mobile finger, reduced "carapace-abdomen bridge", reduced number of leg tarsalia (1-1-1-1), scale-like anteroproximal apophysis on ventral side of leg coxa II, white enclosures in keeled elevations of ventral scutum in ♂♂, terminal setae on truncus penis, and proximad-directed glans penis. Therefore we consider *Oncopus* as a taxon that occupies an advanced position in oncopodid phylogeny, either as the sister group to *Gnomulus* or of *Caenoncopus* (see Schwendinger & Martens, 2002b: fig. 59).

Four species groups are here distinguished. The *feae*-group (*O. feae, O. malayanus* sp. n.) and the *truncatus*-group (*O. truncatus, O. tiomanensis* sp. n., *O. lingga* sp. n.) from the Malay Peninsula and nearby islands are closely related to each other, and both probably have a more distant relationship to *O. doriae* (*doriae*-group) from northwestern Borneo. The *hosei*-group (*O. hosei, O. megachelis, O. expatriatus* sp. n.) appears to be further apart from the other three species groups and sister to them.

Most species are clearly distinct in their penis morphology. Intraspecific variation in genital morphology of *O. truncatus* is considerable, and the penes of this species are only little different from those of *O. tiomanensis* sp. n. In external morphology, however, these species are clearly distinguishable and therefore we treat them as separate species.

We want to draw attention to the light enclosures embedded in the transversal keels of the ventral scutum in ♂♂ of some *Oncopus* species, which are not found in other oncopodids. These cuticular structures possibly have a similar function as the glandular setae of ♂♂ in some *Gnomulus* species (see Schwendinger & Martens, 1999: fig. 69a, b) and they deserve histological investigation.

Cheliceral teeth and palpal claws are strongly worn in old specimens (mature *Oncopus* are presumably long-lived), which indicates that chelicerae and palps are used for digging and for handling obstacles. The shape of the cutting edges of the cheliceral fingers is therefore only useful as a taxonomic character in "young" mature specimens.

ZOOGEOGRAPHY

The genus *Oncopus* occurs in Peninsular Malaysia, on Singapore Island, Sumatra and its islands to the east, and on Borneo. It obviously is restricted to the perhumid zone of the SE-Asian tropics and occurs roughly in between 6°N and 4°S. The two records from Thailand (one of them from near Bangkok and the other from an unspecified locality), based on 2 specimens from the collection of Roewer, are extremely dubious. No additional *Oncopus* specimens have since been collected in this country despite intensive leaf litter sifting in southern Thailand by various persons during recent years. Furthermore, the seasonally dry climate of central Thailand presumably does not meet the ecological requirements of this genus. We would, however, not be surprised if *Oncopus* is one day discovered in the most southern provinces of Thailand.

In contrast to the species-rich genus *Gnomulus*, syntopic occurrences of two or more *Oncopus* species are not known and probably do not exist. Previous records of sympatric *Oncopus* species on relatively small islands (*O. feae* and "*O. alticeps*" on Penang and *O. truncatus* and "*O. acanthochelis*" on Singapore) were long considered dubious, especially since the type of each "sympatric species" either belongs to the opposite sex or to a different postembryonic instar.

Ranges of distribution in *Oncopus* species seem to be fairly small (with the exception of *O. malayanus* sp. n.) and therefore we expect that several unknown species remain to be discovered; most likely so on Sumatra and in the southern part of Borneo from where juvenile specimens are already known.

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